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UNITED STATES.

"I cannot help plead to my countrymen, at every opportunity, to cherish all that is manly and noble in the military profession, because Peace is enervating and no man is wise enough to foretell when soldiers may be in demand again."—SHERMAN.

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TEN YEARS OF RIOT DUTY.*

COMPILED AND ARRANGED
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INTRODUCTION TO PART I.

THE object of compiling the following pages was to place in the hands of the National Guard and its friends a weapon with which to combat the ignorance, indifference and antagonism which the force has to contend against in striving to improve and perfect itself in the duties devolving upon it as a safeguard of the nation, an organized and disciplined body of citizens banded together under the law to uphold and defend its institutions.

Originally intended as a mere statement of the service performed, so many lessons and suggestions presented themselves while collecting and studying the necessary information that the writer ventured to add the latter part of the article in the hope that it might be of some benefit to others as it has been to him.

Starting with a collection of newspaper clippings, the lists have been in the large majority of cases corrected and revised by the Adjutants-General of the various States, so that it is believed that the following compilation is complete within probably ten

* A Record of Active Service performed by the National Guard of the United States from 1886 to 1895 inclusive, with Notes and Comments.

per cent. An effort has been made to have the list verified by the Adjutant-General of each State so far as it concerned his State. The incomplete condition of the records in some cases, however, and a neglect to comply with the request in others, prevented the preparation of a perfect record.

The writer is greatly indebted to the gentlemen at the head of the State Military Departments and also to several others who have assisted in making the record as complete as practicable.

ALABAMA.

1886. No records in Adjutant-General's office.

1887. June 17. Troy. To prevent lynching. Company B, 2d Regiment, about 30 men; on duty two days.

1888. Jan. 27. Tuscaloosa. To prevent lynching. Company F, 2d Regiment, about 40 men; on duty two days.

—May 4. Sandy Ridge. Negro riot. Companies A and D and Troop A, 2d Regiment, about 100 men; on duty two days. Company D, 1st Regiment, about 40 men; held in readiness two days.

—Aug. 18. Alexander City. To prevent lynching. Company I, 1st Regiment, 30 men; on duty one day.

—Aug. 25. Round Mountain. To assist in serving warrants on outlaws. "Etowah Rifles." 27 men; on duty one day.

—Nov. 6. Snow Hill. To suppress riot. Troop B, 1st Regiment, about 30 men; held in readiness a few hours.

—Dec. 6. Birmingham. To prevent lynching and preserve order. 8 companies, 1 troop and 1 battery, all of 2d Regiment; 1 company and 1 battery of 1st Regiment and 1 company, 3d Regiment, in all 405 men; on duty five days.

1889. July 7. Lamar County. To capture a murderer. 1 company, 30 men; two days.

—Aug. 20. Selma. Race troubles. 2 companies, 3d Regiment, about 60 men; held in readiness two days.

—Sept. 27. Pratt Mines. Race troubles. Company G, 2d Regiment, about 20 men; two days. Company K, 2d Regiment, about 30 men; held in readiness.

—Dec. 9. Florence. To prevent lynching. 2 companies, 2d Regiment, about 60 men; two days.

1891. Feb. 1. Carbon Hill. Race riot among miners. Companies G and K, 2d Regiment, about 65 men; on duty two days.

1891. July 4. Johns. Race riot. 1 company; two days.

—Sept. 1. Furman. To protect prisoners. Detail, 20 men from Troop B, 1st Regiment; one day.

—Dec. 26. Choctaw County. To capture outlaws. Section of Battery A, 1st Regiment, 11 men; two days.

1893. July. Pratt Mines. Threatened miners' riot. Whole force, about 2000 men; held in readiness.

—Oct. 4. Decatur. Railroad strike. 5 companies, and one battery of 2d Regiment, 1 company of 3d Regiment; about 250 men; one day.

1894. May 7. Horse Creek. Miners' strike. 2 companies, 2d Regiment, about 75 men; held in readiness.

As a result of this outbreak, a camp of instruction was established at Ensley City, near Birmingham, and the whole State force ordered there by regiments from May 25 to June 23; after this 5 companies of 2d Regiment and volunteers from 3d Regiment remained until June 30.

—June 8. Blue Creek. Miners' strike. Detail from 1st Regiment, 200 men; one day.

—June 12. Chevins Trestle. Miners' strike. Detail of 1st Regiment, 80 men; one day.

—July 8. Birmingham. Railroad strike. 600 men; on duty nine days.

—July 16. Mines near Birmingham. Miners' strike. Whole force, 2000 men; on duty seven days.

—July 19. Adger. Miners' strike. Company G, 2d Infantry; about 40 men.

—July 22. Mines near Birmingham. Miners' strike. Volunteer detail of 400 men from various organizations; withdrawn Aug. 14.

—Nov. 30. Montgomery. Expected political troubles at governor's inauguration. 3 regiments, 1440 men; 2 days.

ARIZONA.

No cases.

ARKANSAS.

(Not officially corrected.)

1894. July 6. Little Rock. Railroad strike. 1st Brigade; about 850 men.

1895. Oct 30. Little Rock. To prevent prize fight at Hot Springs. Companies C and D, 1st Regiment, about 100 men; held in readiness.

CALIFORNIA.

1893. Sept. 1. Redlands. Anti-Chinese troubles. Companies C, E and G, 9th Infantry, 140 men; held in armories two days.

1894. Railroad strike and riots.

—July 4. Sacramento. 1st, 3d and 8th Regiments Infantry; 4 companies, 2d Infantry; 2 companies, 6th Infantry; 1 sec. of Light Battery A, Light Battery B, and 2d Brigade Signal Corps; about 1450 men; withdrawn from July 23 to 30.

—July 4. Oakland. 2d Regiment Artillery, 6 companies 5th Infantry, 3 companies Naval Battalion, 1 company 2d Infantry, 1st Troop Cavalry; about 900 men; withdrawn from July 18 to Aug. 8.

—July 4. Chico. 4 companies 8th Infantry and 1 company 2d Infantry, about 250 men; one day.

—July 4. San José. 2 companies, 5th Infantry; 1 company, Naval Battalion; about 150 men; withdrawn July 16.

—July 12. Sumner. 3 companies, 6th Infantry, about 150 men; withdrawn July 25 to 30.

—July 16. Dunsmuir. 2 companies, 6th Infantry, and 2 companies, 2d Infantry; withdrawn Aug. 2 to Aug. 7; about 225 men.

—July 17. Porta Costa. 1 company, 2d Infantry, and 1 company, 5th Infantry; about 100 men; withdrawn July 19 to 27.

—July 18. Truckee. 2 companies, 1st Infantry, and 2 companies, 2d Infantry; about 200 men; withdrawn July 25 to Aug. 7.

—July 19. Alameda. 1 company, 5th Infantry, about 50 men; withdrawn July 22.

—July 22. Woodland. 1 company, 2d Infantry, about 50 men; withdrawn July 25.

—July 23. Red Bluff. 1 company, 8th Infantry, about 50 men; withdrawn July 29.

COLORADO.

(Not officially corrected.)

1887. August. Northwestern Colorado. Indian troubles. 100 men (estimated).

1891. Jan. 16. Denver. Legislative dispute. 3 companies; 150 men (estimated); held in readiness one day.

1891. December. Crested Butte. Miners' strike and riot. 200 men (estimated); held in readiness.

1893. April. Southwestern Colorado. Indian troubles. 10 companies; 500 men (estimated); held in readiness.

—July. Denver. To guard camp of unemployed men. 100 men (estimated).

1894. March 15. Denver. Political dispute. 1st Regiment and Battery A; 350 men (estimated).

—March 17. Cripple Creek. Miners' strike and riot. 10 companies; 500 men (estimated); three days.

—June. Cripple Creek. Miners' strike and riot. 500 men (estimated).

CONNECTICUT.

1889. Feb. 18. Hartford. Fire. 5 companies (A, B, F, H, K, 1st Infantry), 350 men; two days.

1891. June 15. Bridgeport. Threatened riot. 2 companies (B and E, 4th Infantry), and Gatling gun. 130 men. Held in readiness for two days.

DELAWARE.

No cases.

DISTRICT OF COLUMBIA.

No cases.

FLORIDA.

1887. Feb. 1. Pensacola. Strike and riot. Company A, 3d Battalion, about 40 men. On duty two days.

1888. Sept. 6. Fernandina. Strike and riot. Company C, 1st Battalion, and A and B, 2d Battalion; about 100 men. On duty four days.

1889. Oct. 26. Key West. Cigar makers' strike. Company A, 2d Battalion; about 40 men. Held in readiness for several hours.

1890. Jan. 21. Apalachicola. Strike and riot. Company A, 3d Battalion; about 40 men. On duty five days.

—March 1. Jacksonville. To prevent lynching. Companies A, B and F, 1st Battalion, about 120 men; held in armories a few hours for two nights.

1891. Dec. 27. Wildwood. Race riot. Companies A and B, 2d Battalion, and Company B, 5th Battalion; about 120 men.

1892. July 4. Jacksonville. To prevent lynching and preserve order. Companies A, B, C, D and F (Battery), 1st Battal-

ion, Companies A, B and C, 4th Battalion; 250 men. On duty three days.

1892. Oct. 23. Titusville. Race troubles. Company D, 2d Battalion, and C, 5th Battalion; about 75 men. On duty three days.

1893. March 4. Sanford. To assist sheriff in enforcing law. Company D, 2d Battalion; about 40 men. On duty one day.

—Dec. 25. Wildwood. To assist sheriff in enforcing law. Company A, 2d Battalion; about 40 men. On duty three days.

1894. Jan. 8. Live Oak. To prevent lynching. Company D, 3d Battalion; about 40 men. On duty one day.

—Jan. 23. Jacksonville. To prevent prize fights. 2d Battalion; about 140 men. On duty two days.

—Oct. 3. Jacksonville. Election troubles. Companies A, C and F (Battery), 1st Battalion; about 100 men. Held in armories a few hours.

GEORGIA.

(Not officially corrected.)

1889. Aug. 12. Atlanta. Race troubles. 1 company, 40 men (estimated). Held in readiness one night.

— ———. Jessup. Race troubles; 40 men (estimated).

1890. October. Coffee County. Race troubles. One company, 40 men (estimated).

1892. Oct. 2. Summerville. To prevent lynching. 40 men (estimated).

1893. April 3. Forsyth. To prevent lynching. 40 men (estimated).

1894. January. Folkston. To prevent prize fight. 6 companies; 200 men.

—Feb. 25. Thomasville. To prevent lynching. One company; 40 men (estimated).

—Dec. 28. Augusta. To prevent lynching. 150 men (estimated.

1895. Savannah. February 26. Religious riot. 1st Regiment Infantry, 1st Battalion Infantry, 1 troop, 1st Cavalry; 400 men (estimated). One day.

IDAHO.

(Not officially corrected.)

1891. January. Indian troubles; 200 men (estimated) held in readiness.

1892. July. Wallace. Miners' riots; 200 men (estimated).

ILLINOIS.

1886. April 9. East St. Louis. Railroad strike and riot. 5th and 8th Regiments and a Gatling detachment, in all 710 men. On duty until April 17. Two companies, 75 men, retained until May 24.

—May 5. Chicago. Anarchist riot. Local troops, about 800 men, held in armories.

—Nov. 8. Chicago. Stock yards' strike and riot. 1st and 2d Regiments and Troop E; about 750 men. On duty from two to three weeks.

1887. Nov. 10. Chicago. Threatened riot. 1st, 2d and portion of 5th Regiments, held in armories one night; about 800 men.

1889. May 27. Braidwood. Coal miners' strike. One regiment; 414 men. On duty until June 4.

—June 1. Spring Valley; 179 men. On duty five days.

1893. June 10. Lemont. Quarrymen's strike and riot. 2d and 3d Regiments and Company M, 6th Regiment; 1145 men. On duty five days.

—Aug. 30. Chicago. Threatened labor riot. 2d Regiment held in armories a few hours; about 500 men.

1894. May 25. La Salle. Coal miners' strike and riot. 6 companies, 3d Infantry; 307 men. Gradually withdrawn from 29th to 31st.

—May 25. Centralia. Coal miners' strike and riot. 4 companies, 4th Infantry; 202 men. Withdrawn May 28.

—May 26. Pana. Coal miners' strike and riot. 4 companies, 5th Infantry; 192 men. Withdrawn May 28.

—May 27. Minonk. Coal miners' strike and riot. 3 companies, 5th Infantry; 126 men. Withdrawn May 29.

—June 5. Carterville. Coal miners' strike and riot. 3 companies, 4th Infantry; 160 men. Withdrawn June 7.

—June 7. Peoria. Coal miners' strike and riot. 1 company, 5th Infantry; 51 men. Withdrawn June 12.

—June 8. Edinburg. Coal miners' strike and riot. 1 company, 5th Infantry; 42 men. Withdrawn June 9.

—June 9. Pana. Coal miners' strike. 1st Infantry; 683 men. Withdrawn June 12.

—June 7. Pekin. Coal miners' strike and riot. 3 companies;

one from each of 3d, 5th, and 6th Regiments; 156 men. Withdrawn June 13.

1894. June 18. Mt. Olive. Coal miners' strike and riot. 7th Infantry; 371 men. Withdrawn June 20.

—July 2. Decatur. Railroad strike and riot. 4 companies, 5th Infantry, and Troop B; 265 men. Withdrawn from July 3 to 13.

—July 2. Danville. Railroad strike and riot. 5 companies, 5th Infantry, detail from Battery A and Troop B; 210 men. Withdrawn from July 5 to 16.

—July 3. Mounds. Railroad strike and riot. 6 companies, 4th Infantry; 336 men. Withdrawn from July 6 to 19.

—July 5. Springfield. Railroad strike and riot. 3 companies, 5th Infantry and detachment of 1st Infantry; 217 men. Withdrawn July 9.

—July 6. Chicago. Railroad strike and riot. 1st, 2d, 3d, 6th, and 7th Infantry, portions of 4th and 5th Infantry, Batteries A and D, Troops A and B, 1st Battalion of Naval Militia, in all 4243 men. Gradually withdrawn from July 18 to August 7. In addition to this force, there were on duty about 2500 regular troops, 4000 regular and special police, with deputy marshals and deputy sheriffs to make a total of about 14,000 men.

—July 7. Spring Valley. Riot. 2 companies, 6th Infantry; 128 men. On duty until July 16.

INDIANA.

1886. March 20. Shoals. To prevent lynching. Company A, 2d Regiment; 35 men. On duty a few hours.

1893. Sept. 4. Roby. To prevent a prize fight. 9 companies, 3d Regiment; 2 companies, 2d Regiment; 2 companies, 4th Regiment, and a Gatling detachment from Battery E, 1st Artillery; 613 men. On duty one day. Two companies on duty three days.

1894. June 2. Daviess and Sullivan Counties. Coal miners' strike. 9 companies, 1st Regiment; 4 companies, 2d Regiment; 1 company, 3d Regiment; 1 company, 4th Regiment and two Gatling detachments from Battery A, 1st Artillery; about 650 men. All on duty until June 11 (9 days). Gradually withdrawn until June 21 after service of 19 days.

—July 8. Hammond. Railroad strike. 6 companies, 2d Regiment; 11 companies, 3d Regiment; 6 companies, 4th

Regiment; two Gatling detachments from Batteries A and E, 1st Artillery; 1150 men. Gradually withdrawn from July 17 to July 28, after service of three weeks.

INDIAN TERRITORY.

(No National Guard or similar force.)

IOWA.

1886. March 9. Des Moines. To prevent lynching. Company A, 3d Infantry; 32 men. On duty at jail two nights.

1888. Shenandoah. To capture a murderer. Company E, 3d Infantry; about 40 men. On duty a few hours.

1893. Dec. 21. Oskaloosa. To capture a gang of tramps. Company F, 3d Infantry; 40 men (estimated). On duty a few hours.

1894. April 13. Council Bluffs. Industrial Army. Companies B, C, G, K, L and M, 3d Infantry; 187 men. On duty six days. These same companies with the addition of Company E, 35 men, were afterward held in their armories three days, and Companies H and L, 4th Infantry, 98 men, were held in readiness five days.

—May 30. Evans. Coal miners' strike. Companies A and H, 3d Infantry; 85 men. On duty six days.

—May 30. Muchakinock. Coal miners' strike. Companies G and K, 2d Infantry; 80 men. On duty seven days.

—June 6. Evans. Coal miners' strike. Company F, 3d Infantry; 35 men. On duty two days.

—July 4. Sioux City. Railroad strike. Companies A, C, D, F, G, H, I, L and M, 4th Infantry and Company K, 1st Infantry, with Gatling gun; 436 men. On duty 6 days.

1895. March 15. Algona. Incendiary fires. Company F, 4th Infantry; about 40 men. On duty one night.

—April 11. Cincinnati. Miners' strike. One company; 40 men.

KANSAS.

1886. April 2. Parsons. Railroad strike. 1st Regiment; 240 men. On duty from 6 to 13 days.

1888. June 22. Stevens County. County seat dispute. Companies A and H, 2d Regiment; 81 men. On duty 7 days.

—Aug. 2. Stevens County. County seat dispute. 2d Regiment and Battery B; 341 men. On duty from 8 to 11 days.

1889. Jan. 12. Gray County. County seat dispute. 2d Regi-

ment; about 300 men. One battalion on duty 3 days, one 15 days.

1892. Jan. 5. Seward County. County seat dispute. Companies E and H, 2d Regiment; 60 men. On duty 10 days.

1893. Feb. 5. Topeka. Trouble in organizing Legislature. Companies A, B, C, F and H, 3d Regiment, Company A, 4th Regiment, Batteries A and B and 3 provisional companies. In all 411 men. On duty 3 days.

—July 24. Weir City. Coal miners' riot. 5 companies, 2d Regiment, and 4 companies, 1st Regiment; about 350 men. Held in armories 3 days.

1895. Dec. 12. Topeka. To guard medical college from mob excited by grave robbing. Battery B; 28 men. On duty 3 days. Company H, 1st Infantry; 34 men held in readiness 1 day.

KENTUCKY.

(No accurate records in Adjutant-General's office.)

1886. March. Pulaski County. War on convict miners. 50 men (estimated).

1887. August. Morehead. To guard court. 75 men, 1st Infantry.

—Pineville. To prevent lawlessness. 50 men, 1st Infantry.

1888. Dec. 25. Hazard. To prevent lawlessness. 50 men (estimated).

1889. September. Harlan County. To prevent lawlessness. 50 men (estimated).

1890. March. Louisville. To protect property and preserve order after cyclone. 200 men (estimated). 1st Infantry.

—April 16. Black Mountain. To prevent lawlessness. 100 men (estimated).

—August. Hazard. To guard court house. 50 men (estimated).

1892. July 11. Paducah. Race troubles. One company; 50 men (estimated).

1895. Jan. 21. Mt. Sterling. To prevent lawlessness. One company; 50 men (estimated) held in readiness.

—July 15. Winchester. To prevent lynching. One company; 50 men (estimated).

LOUISIANA.

(Not officially corrected.)

1887. Nov. 5. Pattersonville. Laborers' strike and riot. 3 companies; 120 men (estimated).

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1889. July 7. ——— To prevent prize fight. 2 companies; 75 men (estimated).

1892. Nov. 4. New Orleans. Strike. 400 men (estimated) held in readiness.

1895. March 13. New Orleans. Longshoremen's strike and riot. About 500 men. One week.

MAINE.

1894. Jan. 25. Bath. Fire. Companies C and D, 2d Infantry; 68 men; 5 days.

—May 9. Norway. Fire. Company D, 1st Infantry; 51 men; one day.

MARYLAND.

(No complete records in Adjutant-General's office.)

1887. ——— Frederick. To prevent lynching. Company A, 1st Infantry; about 40 men. On duty about a week.

1890. Nov. 13. Annapolis. To prevent lynching. Company G, 1st Infantry; 42 men. One day.

1894. June 5. Frostburg. Coal miners' strike and riot. 1st, 4th and 5th Infantry (entire brigade); about 1500 men. Withdrawn from June 18 to June 30.

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MASSACHUSETTS.

1887. Feb. 21. Cambridge. Street railroad strike. Companies B, 1st Infantry, and B, 5th Infantry, held in armories for two days; 116 men.

—Dec. 27. Marblehead. Fire. Company C, 8th Infantry, 53 men; five days.

1889. Nov. 26. Lynn. Fire. Companies D, E, F, H, I, K and M, 8th Infantry; 376 men. From two to nine days.

—Nov. 28. Boston. Fire. Companies A, D, G, K, 1st Infantry, A, B, C, H, 9th Infantry, A, B, C, D, 1st Corps of Cadets; 500 men (estimated). Held in armories for a few hours.

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1890. July 27. Lawrence. Cyclone. Company F, 9th Infantry and Light Battery C; 157 men; three days.

1893. March 10. Boston. Fire. Portions of 1st and 9th Regiments, 1st Corps of Cadets and Naval Brigade; held in armories for a few hours; 900 men (estimated).

1894. July 4. Hudson. Fire. Company M, 5th Infantry, 53 men; three days.

MICHIGAN.

1889. May 4. Manistee. Religious disturbance. Company H, 2d Infantry, 37 men. On duty two days.

1894. July 4. Ironwood. Miners' strike and riot. Companies D, E, F, G and H, 5th Infantry, 323 men. On duty until July 30.

—July 3. Threatened railroad riots. 1st Infantry, 515 men. Held in armories twenty-eight hours ready to move on several points.

1895. April 29. Marquette. Ore handlers' strike and riot. Company G, 5th Infantry, 42 men. Withdrawn May 2.

—Aug. 31. Ishpeming. Miners' strike. Companies D, F, G and H, 5th Infantry and H, 3d Infantry, 307 men. Withdrawn September 24. Two divisions of Naval Reserve, 131 men, held in readiness.

MINNESOTA.

1889. July 6. Duluth. Strike and riot of laborers. Company K, 2d Infantry, 47 men. On duty one day.

—April 12. Minneapolis and St. Paul. Street railway strike. Companies A, B, C, D, E and I, 1st Infantry; about 300 men. Held in armories twelve days.

—June 13. Mille Lac. Outbreak of Chippewa Indians. Companies A, B, D, E and I, 1st Infantry; about 250 men, assembled in armories.

—Aug. 12. Cloquet. Miners' strike. Company K, 2d Infantry, 44 men. On duty two days.

1891. July 22. St. Paul. To prevent prize fight. Companies C, D, E and H, 1st Infantry, 222 men. On duty one day.

1892. July 19. Soudan. Miners' strike. Companies A, G and H, 3d Infantry, 144 men. On duty four days.

1894. April 21. St. Cloud. Railroad strike. Company B, 3d Infantry, 32 men. Held in armory twelve hours.

—May 3. Virginia City. Miners' strike. Companies A and H, 3d Infantry, 109 men. On duty eight days.

MISSISSIPPI.

(Not officially corrected.)

1889. July 6. Louisiana line. To prevent prize fight. 7 companies, 250 men (estimated).

—Sept. 1. Minter City. Race troubles. 3 companies, 120 men (estimated).

1893. May. Brook Haven. To prevent lawlessness. 3 companies, 120 men (estimated).

MISSOURI.

1886. March. Centertown. Railroad strike. 1st Regiment Infantry and Battery "A"; about 500 men; on duty ten days. Remainder of force, about 1000 men, held in readiness.

1888. Dec. 10. Bevier. Miners' strike and riot. 2 companies of 3d Infantry, about 100 men; on duty two weeks.

1894. July. Railroad strike. Entire force, 2400 men, held in armories for one week.

MONTANA.

1894. April 20. Various points. Industrial Army. 9 companies, 1st Regiment, about 400 men; held in armories, or the armories guarded until May 7.

—July 4. Butte. Religious riot. Companies B, F and G, 1st Regiment, about 125 men; held in armory until July 23.

NEBRASKA.

(Not officially corrected.)

1891. Jan. 2. Northwestern border. Indian troubles. 18 companies, 850 men. On duty 2 weeks.

—Jan. 8. Lincoln. Dispute about governorship. Co. D, 1st Infantry. 40 men (estimated). 2 days.

1892. Oct. 3. Culbertson County-seat war. 3 companies; 120 men (estimated) held in readiness.

1894. April 20. Omaha. Industrial Army. 2 companies; 100 men (estimated) held in readiness.

—Aug. 10. So. Omaha. Strike. Companies A, B, C, E and L, 1st Infantry; A, C and G, 2d Infantry. About 350 men.

NEVADA.

(Not officially corrected.)

No cases.

NEW HAMPSHIRE.

No cases.

NEW JERSEY.

1887. Jan. 20. Perth Amboy. Threatened labor riot. Company "D," 3d Regiment; 83 men held in readiness.

1891. Jan. Barnegat Park. Threatened labor riot. 3 companies, 6th Regiment; about 200 men. Held in readiness one day.

NEW MEXICO.

1894. Jan. 10. Santa Fé. To prevent rescue of prisoners. Detail of 15 men of Company B, 1st Infantry. Held in readiness for service.

NEW YORK.

1888. Jan. 14. Jamestown. Attempt of Railroad company to lay track across a street after an injunction had been served. 13th Separate Company, on duty three days, with about 90 men.

—March 1. Hudson. Guard at jail during an execution. 23d Separate Company; about 70 men.

—Nov. 29. Olean. To assist in service of civil process. 43d Separate Company; about 70 men.

1890. June 21. Schuylerville. To assist in suppressing a mob. 22d Separate Company; 78 men held in armory 3 hours.

—Aug. 9. Syracuse. Railroad strike. 26th, 29th and 38th Separate Companies and 5th Battery; about 250 men. On duty 3 days.

1892. June 13. Tonawanda. Strike of lumber handlers. 25th and 42d Separate Companies; about 150 men. On duty 3 days.

—Aug. 15. Buffalo. Railroad switchmen's strike. 4th Brigade, and portions of the 1st, 2d and 3d Brigades, in all, 7196 men. On duty until Aug. 28—two weeks.

—Aug. 19. Waverly. Railroad strike. 20th Separate Company and 6th Battery. About 135 men. On duty one week.

—Sept. 13. Fire Island. To enforce cholera quarantine. Portions of 13th, 14th, 47th and 69th Regiments, and Naval Battalion. In all about 1100 men. Length of time on duty varying from one day to three weeks.

1893. June 16. Tonawanda. Strike of lumber handlers. 25th and 42d Separate Companies. About 135 men. On duty three days.

1894. July 16. Oswego. Strike of lumber handlers. 48th Separate Company; 84 men; on duty five days; 41st Separate Company; about 75 men held in readiness in armory.

1895. Jan. 19. Brooklyn. Street railroad strike. 2d Brigade on duty two weeks; 1st Brigade on duty one week (9th Regiment held in armory), 5909 men in all. 3d Brigade notified to be in readiness for orders, but not assembled.

NORTH CAROLINA.

1886. No records in Adjutant General's office.

1887. April 16. Raleigh. Prison riot. Co. C, 1st Infantry; 53 men. On duty three days.

—Aug. 3. Elizabeth City. Negro riot. Co. E, 1st Infantry; 51 men. On duty four days.

1889. Feb. 8. Wayne County. Race troubles. Co. E, 1st Infantry; 49 men. On duty two days.

1891. Jan. 21. Elizabeth City. To enforce oyster law. Co. E, 1st Infantry; 50 men. On duty ten days.

—April 16. Charlotte. To prevent lynching. Co. G, 2d Infantry; 37 men. On duty 10 days.

—May 18. Wilmington. Guard for jail to prevent rescue of prisoner. Co. C, 2d Infantry; 52 men. On duty two days.

1892. Nov. 13. Winston. Fire. Co. A, 3d Infantry; 46 men. On duty two days.

1893. April 23. Newberne. To remove negro squatters. 1st Reg't Infantry and 4th Division of Naval Battalion; 438 men. On duty five days.

1894. July 3. Raleigh. To guard prisoner. Co. C, 1st Infantry. 50 men on duty five days.

—July 11. Goldsboro. To guard prisoner. Company D, 1st Infantry; 49 men. On duty three days.

—July 22. Louisburg. Guard at execution. Company B, 1st Infantry; 41 men. On duty two days.

—Aug. 10. Burlington. To guard jail. Company F, 3d Infantry; 46 men. On duty two days.

1895. April 22. Bath. Negro riot. Company G, 1st Infantry; 40 men. On duty four days.

—May 18. Winston. Race troubles. Company A, 3d Infantry; 38 men. Held in readiness.

—Aug. 11. Winston. Race troubles. Company A, 3d Infantry, and Gatling detachment; 57 men. On duty six days.

NORTH DAKOTA.

1890. Dec. Pine Ridge. Indian troubles. Whole force, 500 men. Held in readiness three days.

1893. June 7. Fargo. Preserving order at fire. Company B, 1st Infantry; 40 men (estimated). On duty two days.

—July 10. Devil's Lake. To prevent lynching. Company D, 1st Infantry; 40 men (estimated). On duty one day.

1894. Aug. 13. Jamestown. Preserving order at fire. Company H, 1st Infantry; 40 men (estimated).

OHIO.

1886. May 5. Cincinnati. Threatened labor riot. 1st, 3d, 7th, 14th and six companies of the 17th Infantry, Batteries B, E and H, 1st Artillery; 1828 men. Held in armories and camps in or near the city. Withdrawn from May 13 to 18.

1887. April 27. Paulding County. To protect water works from destruction by mob. Detachments from Toledo companies of 16th Infantry and Battery D; 118 men. On duty ten days.

—Nov. 6. Zanesville. Fight between railroads about track laying. One company 17th Infantry and Battery C; 85 men. On duty one day.

—Dec. 10. Fairport. Ore-handlers' strike and riot. Companies A, B and F, 5th Infantry; 140 men. On duty eight days.

1892. April. Newark. To prevent lynching. Company G, 17th Infantry; 62 men. One day.

1893. July 21. Dayton. To prevent lynching. Companies G and I, 3d Infantry; 105 men. On duty three days.

—Nov. 15. Alliance. To prevent lynching. Company K, 8th Infantry; 37 men. On duty two nights.

1894. Jan. 3. Toledo. Fire. Companies A, C and H, 16th Infantry, Toledo Cadets, and Battery D; about 200 men. On duty one night.

—Feb. 19. Springfield. Fire. Company B, 3d Infantry, A, 9th Infantry, and Battery E; 91 men. On duty a few hours.

—Feb. 23. Cincinnati. To protect armory against threatened violence. Detail of 15 men, 1st Infantry. On duty 44 days.

—April 15. Rushsylvania. To prevent lynching. Company F, 2d Infantry; 21 men. On duty a few hours.

—April 28. Mt. Sterling. Industrial Army. Companies A, B, C, F and L, 14th Infantry, and Battery H; about 200 men. On duty one day.

—May 2. Cleveland. Riot by unemployed men. Companies A, B, F and I, 5th Infantry and 1st Troop of Cavalry; 270 men, held in armories three days. Total force, regu-

lar and special police, independent companies and National Guard; about 1000 men.

1894. May 9. Akron. Riot by unemployed men. Company B, 8th Infantry and Battery F; 110 men. On duty six days.

—May 30. Glouster. Coal miners' riot. Companies A, B, H and K, 17th Infantry and Battery H; 200 men. Assembled in armories but dismissed in a few hours, except one company (A), which was on duty two days.

—July 7. Cincinnati. To protect armory against threatened attack. 30 men of 1st Infantry. On duty eleven days.

—July 21. Clyde. Industrial Army. Company I, 16th Infantry; about 50 men. On duty one day.

—July 27. New Lexington. To prevent lynching. Company A, 17th Infantry; 24 men. On duty 4 days.

—June 6. Eastern Ohio. Coal miners' riots in five counties. 2d Infantry, 3d Infantry (3 companies), 5th Infantry, 8th Infantry, 14th Infantry, 16th Infantry, 17th Infantry (7 companies), Toledo Cadets (1 company), Batteries C, D and H, 1st Light Artillery. In all 3371 men. Also 6 companies 3d Infantry; 276 men, held in armories. Withdrawn from June 15 to 21.

—Oct. 17. Washington Court House. To prevent lynching. 7 companies, 14th Infantry; 9 companies, 1st Infantry; 1 company, 3d Infantry; 1 company, 17th Infantry and Battery B; about 600 men. On duty two days.

1895. Oct. 27. Tiffin. To prevent lynching and guard jail. Companies E, G and I, 2d Infantry and D and I, 16th Infantry; 250 men. On duty three days.

OKLAHOMA.

1894. July. Enid and Round Pond. Railroad war. One company at Guthrie, held in readiness, 40 men (estimated).

OREGON.

(Not officially corrected.)

1891. September. The Dalles. To protect property and preserve order at fire, 100 men (estimated).

PENNSYLVANIA.

1889. June 4. Johnstown. Flood. 14th Infantry, 489 men. On duty until June 29.

1890. Aug. 19. Wilkesbarre. To protect property after cyclone. 100 men from Companies A, B, D and F, 9th Infantry. On duty two days.

1891. April 2. Mt. Pleasant. Coal miners' strike and riot. 10th and 18th Infantry; 900 men on duty until April 18.

1892. June 5. Oil City. Flood. Company D, 16th Infantry; 50 men (estimated).

—July 10. Homestead. Iron workers' strike and riot. 2d and 3d Brigades, 5650 men; on duty until July 28, when the 3d Brigade and part of the 2d were relieved. Balance of 2d Brigade gradually withdrawn from July 28 to October 14. 1st Brigade, 2650 men, ordered into camp at Mt. Gretna, July 10, and held as a reserve until July 19.

1894. June 21. Punxsutawney. Labor riot. 5th and 16th Infantry and Sheridan Troop; 1052 men. On duty until July 3.

RHODE ISLAND.

No cases.

SOUTH CAROLINA.

(Not officially corrected.)

1889. August 23. Mt. Pleasant. Race troubles. 2 companies; 80 men (estimated).

1890. July. Kearse. Race troubles. 40 men (estimated).

—Nov. 23. Bishopville. Race troubles. 40 men (estimated).

1891. Dec. 7. Edgefield County. To prevent lynching. One company. 40 men (estimated).

1892. July 26. Irmo. To prevent lynching. One company. 40 men (estimated).

1893. September. Aiken. To prevent lynching. One company. 40 men (estimated).

1894. April 1. Darlington. To enforce dispensary law. About 400 men.

1895. Oct. 14. Greenwood. To prevent lynching. One company. 40 men (estimated).

SOUTH DAKOTA.

(Not officially corrected.)

No cases.

TENNESSEE.

(No complete records in Adjutant-General's Office.

1889. July 13. Somerville. Guard at execution. One company of infantry. 40 men (estimated).

1890. April 26. Greenbrier. To prevent lynching. One company of infantry. 40 men (estimated).

1891. March 14. Nashville. Insane Asylum fire. Company F, 1st Infantry and Battery A. About 80 men. Assembled in armories.

—June 23. Nashville. Race troubles. Company F, 1st Infantry and Battery A. About 80 men. Held in armories two nights.

—July 16. Anderson County. Convict miners' war begun, which lasted over two years. Companies A, B, and C, 3d Infantry, 76 men, were sent to Briceville to replace a camp of convict miners which had been driven out by the free miners. These troops were forced to surrender seven days later.

—July 25. The 1st Brigade, about 500 men, assembled in Knoxville and remained there until Aug. 1, when they were dismissed, the convict miners being returned to Briceville according to agreement with the free miners. Jan. 1, 1892, as a result of continued lawlessness a permanent force known as Company G, 2d Infantry, 85 men, was organized and stationed at Coal Creek in a fortified position. Jan. 19, this post was reënforced by Company C, 3d Infantry, about 40 men. A few weeks later the latter company was ordered to Oliver Springs, remaining there until June 1. Aug. 15, a force of 22 men of various commands from Knoxville at Oliver Springs, was attacked and compelled to retire. Aug. 16, an attack was made on the permanent garrison of 100 men at Coal Creek, but successfully resisted. Aug. 18, the 1st and 2d Infantry, Battery A and 300 volunteers arrived and occupied Coal Creek. A portion of this force was ambuscaded and lost 2 killed and 6 wounded. These troops were gradually withdrawn from Aug. 20 to Oct. 30. On Oct. 9, 1893, the permanent garrison at Coal Creek was withdrawn after being in service since Jan. 1, 1892.

1892. March 7. Memphis. Race troubles. Companies A, B and E, 2d Infantry and Battery B, about 150 men, held in armories.

1893. April 20. Tracy City. Convict miners' war. Company F, 1st Infantry and Battery A. About 80 men. On duty six days.

1895. Nov. 29. Fayetteville. To prevent lynching. Companies

A and C, 1st Infantry, and Battery A, 106 men assembled, and held in armories about an hour.

TEXAS.

1886. April 4. Fort Worth. Railroad strike and riot. Nine companies of infantry; 290 men. On duty four days.

—April 8. Laredo. Political riot. Two companies of infantry; 80 men. On duty three days.

1887. Sept. Richmond. Political riot. One company of infantry, 27 men; on duty two days. One company infantry and one troop cavalry, 80 men (estimated). Held in readiness.

—Sept. Matagorda County. Race troubles. Details from three companies 3d infantry; 50 men; five days.

1888. Madison county. To prevent lynching. One company 2d Infantry, 20 men. On duty five days.

—May 21. Hempstead. To guard jail. One company of infantry, 30 men (estimated); eight days.

1889. June 1. Floresville. To prevent lynching. Detail of 11 men; eight days.

—June 16. Bastrop. To protect prisoners. One company of infantry, 21 men; eight days.

— June 25. Wharton county. To prevent lawlessness. One company of infantry, 26 men.

—Aug. 16. Richmond. Political riot. Two companies of infantry, 52 men; two days.

—Sept. 13. Seguin. To prevent lynching. Two companies infantry, 42 men; two days.

—Oct. 21. Wharton. To guard court. Detail of 16 men; five days.

1890. June 4. Palestine. To prevent lynching. One company, 30 men (estimated).

1891. May 5. Corpus Christi. To disperse a mob attempting to prevent health officials from removing small pox patients to hospital. One company of infantry, 30 men (estimated).

—Sept. 3. Eagle Pass. To prevent rescue of prisoner. One company of infantry, 30 men (estimated); thirty days.

1894. July. Galveston. Railroad strike. One company of infantry, 30 men (estimated), on duty several days. 2000 State troops were in camp at Austin at the time and were held in readiness for service.

In addition to the above, many cases have occurred of the use of the State Rangers, a permanent mounted military force, to suppress disorder, enforce the law and assist the civil authorities generally.

UTAH.

1894. April 8. Ogden. Industrial Army. Companies A, B and C, 1st Infantry, Troop A, and 1st and 2d Batteries. 220 men. On duty five days.

—May 12. Provo. Industrial Army. Companies A and B, 1st Infantry, Gatling detachment from 1st Battery, 92 men. On duty two days.

VERMONT.

No cases.

VIRGINIA.

1886. Aug. 31. Richmond. To prevent escape of prisoners from penitentiary. 250 men (estimated).

1887. Jan. 12. Newport News. Stevedores' strike and riot. Companies A and B, 1st Infantry, and State Guard (colored). About 125 men; four days.

—Aug. 30. Petersburg. Race troubles. Company G, 4th Infantry; about 50 men. Held in readiness.

—Nov. 12. Pocahontas. Miners' strike and riot. Company E, 3d Infantry; Battery D and Troop C; 85 men; four days.

1888. Jan. 31. Richmond. To prevent escape of prisoners—fire in penitentiary. About 200 men.

—Sept. 13. Portsmouth. To prevent lynching. Companies B and E, 4th Infantry; about 100 men; one day.

—Nov. 7th. Portsmouth. Race riot. Company E, 4th Infantry; 45 men; one day.

1889. Nov. 5. Portsmouth. Election riot. Company E, 4th Infantry; 40 men; one day.

— —Danville. To prevent lynching. 50 men (estimated).

1890. Jan. Charlottesville. To prevent lynching. Company E, 3d Infantry; about 40 men. One day.

—Feb. 12. Charlottesville. To prevent lynching. Company E, 3d Infantry; 12 men. One night.

—May 30. Boydton. To prevent lynching. Company G, 4th Infantry; 28 men. Four days.

1890. July 6. Alexandria. To prevent disorder. Company F, 3d Infantry; 30 men. Held in readiness.

—July 20. Pocahontas. To prevent rescue of prisoners. Company F, 2d Infantry; about 30 men. One night.

—Aug. 14. Boydton. Guard at execution. Details from Companies A, B and C, 1st Infantry; about 25 men. Two days.

—Dec. 4. Nottoway Court House. To prevent lynching. Companies G and I, 4th Infantry; 50 men. One day.

1891. Jan. 21. Boydton. To prevent lynching. Company G, 4th Infantry; 30 men. Six days.

—Feb. 18. Hampton. To prevent lynching. Company D, 4th Infantry; about 30 men.

—March 13. Nottoway Court House. To prevent lynching. Company G, 4th Infantry; 25 men. One day.

—April 21. Charlottesville. Guard at execution. Company D, 3d Infantry; 31 men. On duty a few hours.

—July 25. Roanoke. To prevent lynching. Company G, 2d Infantry; about 40 men. On duty two nights.

—Oct. 18. Clifton Forge. Negro riot. Company D, 3d Infantry; about 30 men. One day.

1892. Feb. Roanoke. To prevent lynching. Company G, 2d Infantry; about 40 men.

—March. Roanoke. To prevent lynching. Company G, 2d Infantry; about 40 men.

—Nov. 8. Newport News. Election riot. Company C, 4th Infantry; about 40 men.

1893. Sept. 17. Danville. To prevent lynching. Companies A and H, 3d Infantry; about 75 men. Two days.

—Sept. 20. Roanoke. To prevent lynching. Companies G and H, 2d Infantry; about 75 men. On duty a few hours.

1894. Feb. 8. Manassas. To prevent lynching. Company F, 3d Infantry; 65 men. Two days.

—Feb. 12. Manassas. To prevent lynching. Company F, 3d Infantry; 70 men. Two days.

—March 7. Manassas. To prevent lynching. Company F, 3d Infantry; 84 men. Two days.

—April 30. Staunton. To prevent lynching. Companies C and K, 2d Infantry, and D, 3d Infantry; 150 men. Four days.

—Aug. 11. Rosslyn. To remove Industrial Army from State.

Companies A and B, 1st Infantry, and F, 3d Infantry; about 175 men. One day.

1894. Oct. 31. Deep Creek. To enforce oyster law. Company C, 4th Infantry; 40 men. One day.

1895. March 14. Winchester. To prevent lynching. Companies A, C and D, 2d Infantry; about 125 men.

—May 3. Pocahontas. Coal miners' strike. Companies C, F, G, H, 2d Infantry, C, D, E, G and I, 3d Infantry, A and B, 3d Battalion Infantry, A and B, 4th Battalion Infantry. Troops B, C and K, 1st Cavalry and Battery A; 776 men. This force was not all on duty at one time, being relieved and replaced gradually. Finally withdrawn July 31.

—July 8. Berryville. To prevent lynching. Company D, 3d Infantry; 37 men. Three days.

—July 11. Lunenberg Court House. To prevent lynching. Companies A, B and D, 1st Infantry; about 125 men. Ten days.

WASHINGTON.

1886. Feb. 8. Seattle. Anti-Chinese riot. Companies B, D and E, 1st Regiment; about 150 men. On duty five days.

1889. June 6. Seattle. Fire. Companies B, C, D, E, G, H, 1st Infantry; about 250 men. Two weeks.

—June 25. Vancouver. Fire. Company H. 1st Infantry; 50 men (estimated). Two days.

—Aug. 4. Spokane. Fire. Company G, 2d Infantry; 50 men (estimated). Two weeks.

1891. June 28. Franklin, Gilman and Newcastle. Coal miners' strike and riots. Companies B, C, D, E, G, I, 1st Infantry, and Troop B, 1st Cavalry; about 300 men. Two weeks.

1894. Nov. 9. Ellensburgh. Threatened riot. Company A, 2d Infantry; 50 men. Gradually withdrawn from Nov. 10 to 20.

1895. Aug. 19. Ellensburgh. Threatened riot. Company A, 2d Infantry; 44 men. Six days.

WEST VIRGINIA.

1894. Feb. 28. Eagle Mines, Fayette Co. Coal miners' strike and riot. Companies C, G, and K, 2d Infantry; about 100 men. Withdrawn from March 9 to 13.

—March 2. Cabin Creek, Kanawha Co. Coal miners' strike and

riot. Companies F and I, 2d Infantry; about 60 men. Held in readiness three days.

1894. March 4. Fayetteville. To prevent rescue of prisoners, Companies G and I, 2d Infantry; about 60 men. On duty three days.

—May 29. New Haven Mines, Mason Co. To prevent invasion of striking coal miners from Ohio. Companies G and I, 2d Infantry; about 60 men. One day.

—June 4. Kenova. To prevent lawlessness of striking coal miners from Ohio. Companies F, G and I, 2d Infantry; about 100 men. Held in readiness one day.

—June 8. Boggs Run. Coal miners' strike and riot. Companies C, D, E, F, G, H and K, 1st Infantry, and E, F, G and I, 2d Infantry; about 350 men. Withdrawn from June 14 to 18.

—July 7. Kenova. Industrial Army. Companies G and I, 2d Infantry; about 60 men. On duty one day.

1895. July 5. Elkhorn. Coal miners' strike and riot. 8 companies, 2d Infantry; about 250 men. Held in readiness five days.

WISCONSIN.

1886. May 4. Milwaukee. Labor riot. 1st Regiment Infantry, 4th Battalion Infantry, 1 company, 2d Infantry, Light Horse Squadron and 1st Battery; 836 men. Gradually withdrawn from May 8 to May 13.

1889. July 20. West Superior. Strike and riot. Company E, 3d Infantry; 49 men. On duty five days.

1890. Dec. 19. Wausau. Protection of public land buyers. Company G, 3d Infantry; 41 men. On duty two days.

1892. Oct. 28. Milwaukee. Fire. Details from 4th Battalion Infantry, Troop A and Battery A; 150 men.

1893. April 15. Clinton Junction. To prevent lynching. Company I, 1st Infantry; 41 men.

1894. July 9. Spooner. Railroad strike. Companies C, E, H and L, 3d Infantry; 219 men. Held in armories three days.

WYOMING.

1895. Indian Troubles. One company of infantry; 40 men (estimated). Held in readiness.

CLASSIFICATION OF CASES, BY STATES AND YEARS.

STATE.	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	Totals
Alabama		1	6	4		4		2	8		25
Arizona											0
Arkansas									1	1	2
California								1	11		12
Colorado		1				2		2	3		8
Connecticut				1		1					2
Delaware											0
Dist. of Columbia											0
Florida		1	1	1	2	1	2	2	3		13
Georgia				2	1		1	1	3	1	9
Idaho						1	1				2
Illinois	3	1		2				2	16		24
Indiana	1							1	2		4
Iowa	1		1					1	5	2	10
Kansas	1		2	1			1	2		1	8
Kentucky	1	2	1	1	3		1			2	11
Louisiana		1		1			1			1	4
Maine									2		2
Maryland		1			1				1		3
Massachusetts		2		2	1			1	1		7
Michigan				1					2	2	5
Minnesota				4		1	1		2		8
Mississippi				2				1			3
Missouri	1		1						1		3
Montana									2		2
Nebraska						2	1		2		5
Nevada											0
New Hampshire											0
New Jersey		1				1					2
New Mexico									1		1
New York			3		2		4	1	1	1	12
North Carolina		2		1		3	1	1	4	3	15
North Dakota					1			3			4
Ohio	1	3					1	2	13	1	21
Oklahoma									1		1
Oregon						1					1
Pennsylvania				1	1	1	2		1		6
Rhode Island											0
South Carolina				1	2	1	1	1	1	1	8
South Dakota											0
Tennessee				1	1	3	1	1		1	8
Texas	2	2	2	6	1	2			1		16
Utah									2		2
Vermont											0
Virginia	1	3	3	2	7	6	3	2	6	4	37
Washington	1			3		1			1	1	7
West Virginia									7	1	8
Wisconsin	1			1	1		1	1	1		6
Wyoming										1	1
Totals	14	21	20	38	24	31	23	28	105	24	328

CLASSIFICATION OF CASES, BY CAUSES.

Riots consequent upon labor troubles	118
To prevent lynching	66
Race troubles (negroes and whites)	25
To protect property and preserve order at fires, cyclones, floods, etc.	25
To suppress disorder, miscellaneous	21
To enforce law, miscellaneous	12
Election and political troubles	11
To prevent lawlessness by "Industrial Army"	9
To prevent prize fights	7
Indian troubles	7
To capture criminals	4
To prevent rescue of prisoners	5
County seat "wars"	5
Guards at executions	5
Religious troubles	3
Anti-Chinese riots	2
To prevent escape of prisoners	2
To enforce quarantine	1
Total	328

NUMBER OF TROOPS ON DUTY.

	Actually in Service.	Held Under Arms in Readiness for Service.	Total.
1886	5751	1800	7551
1887	1242	1129	2371
1888	1946	70	2016
1889	3433	1180	4613
1890	1315	728	2043
1891	3659	1040	4699
1892	16,665	3320	19,985
1893	4045	4390	8435
1894	32,051	5205	37,256
1895	8320	1028	9348
Total	78,427	19,890	98,317

NOTES AND COMMENTS.—INTRODUCTION TO PART II.

The following notes are not intended as a complete or connected treatise on riot duty, but merely as a collection of lessons and comments derived from a study of the above record, being therefore necessarily somewhat disconnected and fragmentary. The writer makes no pretense of being an authority on the subject.

The lessons to be deduced are those which any one with com-

mon sense and a military training could extract from the given material, and the author considers therefore that a service of fifteen years in infantry, artillery, cavalry and staff work in three States fits him perhaps to make those deductions intelligently. Many of the points touched upon are of course well known to most officers, especially to those who have been called into active service. It is hoped that the following pages will, however, be of some value to those who have not had that experience, but who are liable to be called upon at any time in the present condition of affairs in this country. If the book will have the effect of bringing about a greater efficiency in the National Guard service, even in a slight degree, the author will consider himself well repaid for his trouble.

CHAPTER I.—INSTRUCTION AND PREPARATION FOR SERVICE.

As riot duty is the work the National Guard will most probably be called upon to perform, it follows that a large proportion of its training should be with that object in view. It will undoubtedly be found in case of more important emergencies and larger operations which might possibly arise in the future, that this training will have well fitted them for work on a more extensive scale, in the same way that the border warfare which our army has gone through for years past has prepared it in a high degree for campaigns of greater magnitude should it ever be called upon. Officers and men have been taught to care for themselves, their horses, and guns, while minor commanders have been well trained in that most valuable attribute, self-reliance in the field.

All Instruction Given Should be Practical.—It will be found that if, instead of marching the company or battalion around the smooth floor of the armory every drill night, it is taken out on the streets and made to walk over cobble stones, or manœuvre over the rolling surface of the nearest park, that the men will acquire the ability to hang together on rough ground such as they are liable to encounter in railroad yards or in the vicinity of mine shafts. Officers who have not yet emerged from the shadows of custom and precedent will object to out-door drilling after dark on the ground that it is harder to handle their men under such circumstances and prejudicial to discipline. This is, no doubt true to some extent, but when we consider that night marching and street duty were of frequent occurrence at Chicago in July, 1894, at Brooklyn in January, 1895, and in many other minor cases

it would seem as if it should be practiced often enough to overcome those obstacles.

The *physical training* of the men should be insisted upon. A gymnasium is a necessity in an armory, and the men should be required to practice regularly, part of the time being taken from the regular drills for the purpose.

Bayonet and sabre exercise are of great value both as purely physical training and also military. Many cases could be cited from the list where both these weapons have been used. While perhaps positions exactly corresponding to "quarte parry" and "rear point" would not be utilized, still it is evident that a knowledge of several studied moves will enable a soldier to handle his weapon more effectively against his adversary than if he had not been so instructed.

Guard duty is such an important subject that it is really astonishing to observe its neglect in armories. In many organizations it is the custom to let it entirely alone until just prior to an annual encampment, then perhaps making a feeble effort to give some instruction in it. The result is that valuable time is consumed in camp, teaching men something which they should be now prepared to put into practice with ability. If this method is true of encampments how much more is it open to criticism in cases of sudden emergency, when no time is available for teaching, every man being required to do duty in which he should be already well instructed? Guard duty should be made a feature of every drill evening, a small detail being mounted and reliefs changed regularly under the supervision of an officer. There is nothing in the subject which cannot be taught in the armory, and it of course should be done, when we consider that a large part of the active service which the men will be called upon to perform will be guard duty in some form.

Outpost and picket duty are of frequent occurrence where any service of magnitude is to be performed. They cannot well be taught in armories. Utilize encampments, holidays or other available opportunities; divide the regiment or battalion into detachments and send them out from the camp or armory completely equipped, able to bivouac over night and subsist themselves, and require commanders to maintain communication with headquarters and send frequent reports, inspecting officers observing the work and giving instruction.

Patrol service for city work can be taught by sending out from

the armory a squad under a sergeant, or an entire platoon or company, over a route specified generally, but allowing the officer in charge to exercise his discretion and bring in all possible information required by his instructions. Direct him perhaps to effect a junction with another detachment coming from a different direction.

Extended order drill is of great value and frequently used in clearing streets, railroad yards, squares, keeping back crowds at fires and on many other occasions which will readily suggest themselves. The theory and practice of this drill can be taught on a limited scale very well in nearly every armory, but for larger movements in open order outdoor space is necessary, such as the parade ground while in camp, a public park, or better still, a tract of broken and varied country, where full intervals can be taken and the men taught to avail themselves of cover and maintain intervals and alignment under difficult conditions.

Street riot drill is plainly of sufficient importance to claim considerable time in the laying out of a proper drill schedule for the season's work. The methods of emerging from and entering armories under a real or threatened attack, the defense of the armory, street column formations and other kindred sub jects have such a direct relation to probable emergency work that they merit considerable attention from commanders of city troops especially.

Rifle practice is an essential. How much greater a moral effect would be exerted on a mob by a body of troops known to be good shots, than by an organization which has given no attention to the subject! Several States have no prescribed system of small-arms practice and what little is done is by some corps whose officers recognize the necessity of it. Troops are called out only when the civil authorities are powerless and are expected to restore order by force of arms, if the mere display of them is not sufficient. Of what use are men who do not know how to handle and use these arms intelligently? Under this heading comes also the *care of rifles.* The occupation of Sacramento in July, 1894, during the railroad riots, found a large percentage of pieces in bad condition, some positively dangerous by reason of rusted firing pins. One citizen was killed and six citizens and one soldier wounded by cartridges exploded when closing the breech blocks. Several cases are on record of the accidental injuries of soldiers by careless handling of pieces, or their danger-

ous condition. These could probably all have been prevented by thorough instruction in the care of the piece by individual men while in armories and by instruction in firing.

The armorer system, which is quite prevalent in many organizations, whereby one man does all the cleaning for the company, is doubtless very convenient and also conducive to long life of the pieces, but decidedly unmilitary, because not practicable in the field. Then each man would be obliged to care for his rifle himself and having had no instruction would quite likely do it imperfectly and perhaps injure the piece.

Practice in *skirmish firing* will prove of great value in service.

Revolver practice is also desirable for officers and mounted troops.

Brigade drills, parades and reviews are of very little, if any, value in preparation for riot duty. No case can be found where a brigade manœuvred as such while on that kind of service. Troops have been in brigade and divisional camps while on such duty, but the active work has been done by smaller bodies. While a brigade review is perhaps a necessary evil when the "Governor comes to camp," the use of valuable time in preparation for it or marching into the adjacent city for a street parade are to be deprecated.

Accuracy of drill is not essential to make good soldiers. *Discipline* is of far greater value. When a company can execute one movement fairly well, try another, until the whole ground has been covered. One reason many companies spend most of their time on a few old movements is that they are kept back by the presence of recruits. A company commander who puts his recruits directly into the ranks or after a few drills by a corporal, can never expect his command to progress beyond a certain point. The *recruit squad* is the remedy for this condition of affairs. No man should be allowed in the ranks until he has been taught everything that can be imparted to him alone or with a few companions. This will take a much longer time than is usually given, but when he knows all that, he will be in condition to join the company and not keep it back.

Officers of organizations in large cities should make systematic *studies of cases liable to arise.* Let a problem be given out by the commanding officer once a month, as to the best way to protect a railroad company in running its trains, how to guard a jail, public building, gas, electric light and water works, keep a mob

from molesting a large manufacturing establishment, or any other of the many contingencies liable to occur in a community with a mixed or turbulent population. Require certain officers to submit plans for the case in hand, discuss fully each problem presented and then let the adjutant or some other officer draw up a scheme embodying the treatment, with suggested improvements, to be filed away for future consideration or emergency.

A *full equipment* for troops in the field should be kept in armories, including a reserve supply of ammunition for emergencies, which should not be used for any other purpose. At least twenty rounds per man should be kept on hand. Some articles, such as blankets, canteens, haversacks and cooking utensils should be kept in the quartermaster's store room, but packed and labeled so that they can be issued quickly.

The *squad alarm list* for rapid assembly, which has proved the quickest and most satisfactory method in most cases, should be posted in the armory, corrected to date, and each sergeant and corporal should have his list of names and addresses with him at all times. The neglect of this precaution will some time oblige the company commander to go to considerable trouble, expense and delay to get his men together. In every city and town there should be a prescribed *militia call* on bells or whistles, which would be interpreted by every soldier as an order to report immediately at the armory prepared for service. This is done in many cities and towns. It should be tested occasionally, as also the alarm list, in order to observe its effect and remedy deficiencies.

At every State headquarters there should be on file at all times carefully prepared *plans for the concentration of troops* at all important points where trouble is likely to occur, such as railroad centres, mining and manufacturing districts. As an illustration, the Adjutant General of Illinois has in his office plans for assembling the entire force at Chicago, Springfield and East St. Louis. Brigade and regimental commanders should also have their *orders* outlined for various cases, while every captain should know clearly what to do upon receipt of orders for service. The senior officer in a town or city should be thoroughly posted on means and methods of *transportation* from his station to objective points. A captain of mounted troops should know just how many and what cars would be necessary to transport his battery or troop, also the best place to load, and be satisfied that the railroad or steamboat

companies have proper facilities for embarking his command. An *emergency ration* should be established by orders and each captain know where he can obtain it on short notice.

Riots of any magnitude generally give at least a few days' warning of their approach, but so many cases have occurred without any intimation, that the only safe way to meet them is to be ready at all times.

As an illustration of this may be taken the case in Maryland in 1894. Without the slightest warning the commanders of the 4th and 5th Regiments, in Baltimore, received orders about noon, June 5th, to assemble their commands in heavy marching order with two days' cooked rations to proceed to the Frostburg mines. At four o'clock in the afternoon the regiments were ready, and left at six with over ninety per cent. of their strength, to engage in the hardest kind of work for between two and three weeks.

Clothing and Equipment.—One of the most important things for a State to do is to clothe its soldiers in a serviceable field dress, one in which the men can be comfortable under all circumstances. After this is supplied, then begin to think of dress uniforms, if desired, but not before. Blouse, trousers, leggins, campaign hat, overcoat, rubber and woolen blankets, are necessary articles of issue. Men are expected to know enough to provide themselves with good shoes, stockings and extra underclothing, but experience has shown that many do not. Several cases have occurred where issues of shoes were necessary to troops in service, on account of rough wear on private property worn from home. Company commanders should insist on proper attention to these points, mentioning them in assembly order if necessary. An article of great comfort and uniformity is the dark blue flannel shirt familiar to regulars and many National Guardsmen.

The campaign hat is the most comfortable headgear yet issued for all-round work, and has evidently come to stay. The blue overcoat with cape is in general use and seems to give satisfaction. A recommendation worth considering, however, is that made by Col. Henshaw, 8th California, in his report on active service in July, 1894, that "a brown duck overcoat, blanket lined, wears longer, shows use less and is cheaper." The question of superiority between the web belt, and the cartridge box, does not seem to be settled in all minds, both being largely used. The adoption of the former by the army, however, after long experience and its better distribution of load than by the box, seems to

give the web belt the first place. A canteen and haversack are as necessary articles for a soldier as his hat, and should of course be issued. A serviceable form of knapsack should always be carried by troops when leaving their own towns. Neither the blanket bag nor the old box frame knapsack seems to be satisfactory. The Merriam pack appears to have given good results in the organizations using it.

Mounted troops should be equipped with all articles calculated to insure the comfort and convenience of horses and men, such as halters, nose-bags, saddle bags, picket ropes, paulins and several other things familiar to artillery and cavalry officers. While both leather and canvas leggins have been experimented with in the army and National Guard, the writer believes that the boot will give greater satisfaction and the best results for general work for mounted men in all kinds of weather. The rubber poncho is a very convenient article at times.

Personnel.—The National Guard of this country, to be thoroughly reliable and efficient, must comprise representatives of its best elements, the large intelligent and law-abiding class of citizens upon whom the strength and safety of the nation depends. This is undoubtedly the case at the present time, to a high degree, but instances have occurred within a few years which show that there are exceptions to the rule. A soldier should remember that when he enlisted he became a part of the organized force of his State which stands behind its chief executive to enforce laws enacted by representatives of the people. The officer or soldier has no more right to question the wisdom or justice of enforcing those laws than has a policeman to refuse to arrest a man for an offense the punishment for which the officer considers too severe or perhaps unnecessary. If the laws are unsatisfactory to a National Guardsman he should leave the service and remain out until there is nothing on the statute books to which he can object.

An order from superior authority to perform certain duty which is in accordance with the law of the land, should be sufficient to bring out every man, however unpopular the cause. Police work is not an agreeable business for amateurs but the proper sense of duty should be strong enough to overcome any personal opinions. An observance of this principle would have prevented a certain militia company from refusing to guard a jail and protect a prisoner from lynching, and also the spectacle of

several hundred troops in South Carolina in March, 1894, refusing to obey the order of the governor in his attempt to enforce the unpopular dispensary law.

A rather delicate subject to handle is the presence of *members of labor unions* in the ranks. The writer touches upon this point because of the avowed hostility of the leaders of the unions to the National Guard. If this sentiment existed among laboring men generally it would be a more serious matter but considerable experience has convinced him that such is not the case. Large numbers of labor union men are in the service, probably comprising the more intelligent among them, and it is the writer's belief that they can be relied upon to obey orders and do their full duty if properly controlled. In view of the fact, however, that the official sentiment of several unions is against the use of the strong arm of the law in strikes it would be safe for commanding officers to be well satisfied of a man's opinions and intentions before enlisting him.

Other considerations in discussing the personnel of the force are *age* and *physique*. It seems reasonable to argue that in order to successfully cope at close quarters with the class of men met with in railroad, mine and other industrial riots, a force should consist of men at least as mature, strong and determined. Is the National Guard at present so constituted? Has not nearly every regimental commander quite a number of men whose exchange for older and better developed soldiers would improve his regiment for riot duty? The force is maintained for a purpose. Every officer should so regulate his command as to bring it into condition to best effect the desired results. The writer has in mind a battalion of four companies, the average age of the men being nineteen and of the officers twenty-one. He respectfully submits that this organization would not have the moral effect on a mob of foreign miners such as are met with in the central States, as would be exerted by one company of well disciplined men of from twenty-five to thirty years of age.

The case is well covered by Lieut. Parker, Paymaster, 1st Mass. Infantry, who, in a paper read before a school of officers, said:—"The size and stature should be taken into account. Men who look weak or are very small of stature should be rejected. We are enlisting too many small men, too many beardless boys. It is a waste of time and money to take such material. It has a demoralizing effect on the older men. They find these boys

coming into the company and they drop out and refuse to re enlist. The medical department should establish a minimum standard of weight and height, and recruits below that standard should be rejected." This coincides exactly with the writer's experience and opinions. While the legal age limit is eighteen, the force is not maintained for the amusement of everyone who wishes to join it, and only those men should be enlisted who can best do the work for which it is liable.

Organization and Armament.—The proper arrangement and *grouping of infantry companies into regiments* is a matter of great importance in its effect on quick mobilization and concentration. No rigid rule will apply to all cases, as circumstances of lines of transportation, density of population and location of critical points vary so much in different States. There seems to be a considerable diversity of practice on this subject. Pennsylvania's method is to form small regiments of eight companies each; in Ohio, Illinois, Indiana and a few other States the rule is to organize with twelve companies, covering a wide area, while in New York; outside of the largest cities, there are no regimental organizations, but large separate companies.

A reasonable opinion, founded on a study of the results attained with the various methods, seems to be that in a sparsely settled country or one with few large towns, the small regiment is preferable on account of its easier and quicker assembly and supervision. In thickly populated districts or large cities, the twelve company organization is probably better, on account of the inherent advantages of the three battalion system.

Col. Turner, 1st Ill. Infantry, says the three battalion organization and the squad formation, as tested during the Pullman strike in Chicago, 1894, are in his judgment, "a vast improvement for field service over the old forms of organization."

A regiment whose companies are scattered should be kept as much as possible on one railroad line, or on several which converge at some central point. The New York method of separate companies while admittedly good for the individual companies, is decidedly bad for active service, necessitating the formation of provisional regiments with field and staff officers unfamiliar with their duties, or at least strangers to the troops under their administration. *Large companies* have decidedly more moral effect on rioters than the same number of men divided into more companies.

Skeleton organizations are bad in more ways than one, being

top heavy with officers and more expensive to maintain. Some States follow this practice on the ground that such a framework can be largely expanded in case of war. Most such corps with which the writer is acquainted would be swamped by the influx of a sufficient number of men to bring them up to the required strength. The National Guard should be organized for present needs and it will then be found to give satisfaction in any future trouble.

The *size of companies* is regulated somewhat by armory accommodations but the writer believes that sixty men is the smallest advisable, unless that strength is prevented by local conditions of population. One company of a hundred men in a town or city will be found to maintain its efficiency much better than two of fifty each, one or both of which will eventually become of poor or medium quality.

The *Springfield rifle* now in use in the majority of States, appears to be good enough for any work which the National Guard will be called upon to perform. The army gun, whether the present new type or a later improved pattern, will undoubtedly at some time be issued to the State troops, but the only reason the writer can see for advocating it now is the advantage of both services using the same ammunition. As regulars and militia so seldom serve together to the extent of drawing ordnance supplies from the same sources, there does not seem any urgent necessity for striving to secure the new rifle. All officers, of whatever arm of the service, should be issued *revolvers*.

A discussion of *artillery organization and armament* would be more simple were it not for the introduction of an element which is usually admitted not to belong to the artillery, namely, the *Gatling*. Although field-guns have been frequently called into service in the past ten years there is but one recorded case of their actual use. This occurred at Coal Creek, Tenn., in August, 1892, during the war against convict miners, when a howitzer in possession of the permanent garrison was used with effect against an attacking party of free miners. It is very probable, judging from past experience, that the use of field-guns in riot work will be ver limited in the future.

Lieut. Satterlee, 3d U. S. Artillery, in a report on the Alabama State troops, says: "The dissemination of artillery teaching is of course very desirable; it is a question, however, whether the end attained or attainable justifies the means. Unless it be the

policy of the State to horse and properly equip its field batteries and provide adequate ammunition for practice, the Gatling gun might well be introduced and replace the field-piece. This gun need not be horsed, save for special occasions. Such a weapon for the State's purpose would be more useful, more effective and far more economical." While the writer agrees with this he hopes that it will not have the effect of causing the light field batteries to be abolished. It should rather serve to induce State authorities, and the general government particularly to properly arm and maintain these organizations.

Although in opposition to the extreme theory that nothing not available for riot service should be incorporated into the National Guard, the writer believes these batteries should be retained and put into good shape, on the well-known principle that it takes longer to make good mounted troops than infantry. The field batteries, although not perhaps of much value as such in riots, would be very necessary organizations in case of war, and should therefore be kept in readiness for such a contingency. The present armament of the National Guard artillery is a travesty on correct methods. The reader is referred to a very interesting little pamphlet on "The Artillery of the U. S. National Guard," by Col. E. C. Brush, of the 1st Ohio Light Artillery Regiment, for a statement of the absurd variety of the guns now in service.

Leaving the subject of field-guns and taking up that of machine or rapid-fire guns, history and experience bring up an important question, namely,—Is the Gatling the best weapon for riot duty? It is the one almost exclusively available in this country for that class of work at present, but is seldom actually used, no such case having occurred in ten years. Its moral effect, however, is immense, probably fully repaying its cost. Col. Brush says: "With some experience in compelling lawless citizens, residing in our country, to obey our country's laws, I am of the opinion that nothing is looked upon by rioters with so much dread as the Gatling."

The only case of the actual use of this arm which the writer recalls was at Batouche, Canada, in 1885, during the Riel Rebellion, when Lieut. Howard repulsed an attack with a Gatling, single-handed, and saved the guns of a field battery, which had been abandoned. Here it certainly performed good service, but personal experience has proved that it is not an ideal weapon,

being liable to be disabled with imperfect ammunition and easily rendered useless by malicious tampering with its lock mechanism. Col. Howard, 4th Maryland Infantry, to whose regiment a Gatling is attached, has requested permission to exchange it for a Hotchkiss two-pounder revolving gun, believing the latter better suited for riot duty. Lieut. Baker, U. S. A., on duty with the Illinois National Guard, says: "The Hotchkiss one-pounder revolving cannon is, I think, preferable to the Gatling for this service." The Adjutant-General of California also recommended that the Hotchkiss rapid-firing gun be drawn from the Ordnance Department and issued to the State's light batteries. The execution done by a Hotchkiss at the battle of Wounded Knee, S. Dakota, five years ago, shows the capabilities of that weapon. These facts show that there is a chance for a difference of opinions on the subject, and those officers who are interested are recommended to study the subject thoroughly.

As to the *proper location for Gatling guns*, the opinion is advanced that as a general rule they should be given to the infantry, instead of being in separate batteries, for several reasons. They are not artillery, having the same range and using the same am munition as the infantry rifle. When grouped in batteries they are concentrated at a few points, when they should for rapid availability be scattered well over the State. In the large majority of cases when used it has been singly. Assignment to infantry regiments would reduce their expense by doing away with the cost of mounted organizations, which is large compared with that of foot troops. The six Gatlings belonging to the State of Massachusetts, formerly attached to the three light batteries, were a few years ago assigned one to each infantry regiment, thereby making them available on sudden call in five cities instead of three. The writer is of the opinion, founded on experience, that it is injudicious to combine field and machine guns in the same battery. He also believes that artillerymen should be armed with revolvers. The sabre is of very little value in this branch of the service.

The value of *cavalry* in riot duty has been clearly proven, as will be shown further on. Its armament, if fully equipped, is too cumbersome for service. Sabre, carbine and revolver are too much for one man to carry and care for. When serving with infantry, which is nearly always the case, the sabre and revolver are the proper weapons, the main reliance being placed on the sabre.

All mounted troops should be provided with *farriers and saddlers* with proper outfits for work in the field.

Engineers are somewhat of a novelty in the National Guard, but experience shows that they would be of great value in all im portant operations. So many cases occur requiring the services of men of scientific and mechanical training that a good engineer organization would seem a necessity. It should comprise men familiar with the handling of electric power wires, the use of explosives, engineering and building construction, railroad work and many other branches which will suggest themselves to commanding officers who have had experience in active work. The officers should be men of both scientific and practical education, able to plan and direct operations both for construction and demolition. The corps should be a working organization, equipped with all necessary tools and appliances and composed of men whose daily avocations fit them for military needs. Any large city could furnish such men, whose services would be found of great value in connection with troops on riot duty.

Every brigade should include a regularly organized *Signal Corps*, the importance of which is so evident that there is no necessity of quoting the many reports of officers on the subject. The men should be largely expert telegraphers, able both to build and manage lines. Several instances are on record where the regular operators being absent, unsatisfactory or in sympathy with strikers, the signal corps men stepped in and assumed control of the lines, repairing and operating the same wherever necessary. They should be able to signal with flag, torch and heliograph. In cities there should be signal communications between armories, headquarters or other important points as a part of the regular instruction. A certain number of the corps might well be mounted on bicycles for courier work when practicable and for rapid movement between signal stations. The writer believes this is the only field in which military bicycling will be a success and considers the wheel of no general military utility, as a means of locomotion for other branches of the service.

In every State there should be a *Hospital or Ambulance Corps*, composed of men trained to the work, attached to brigade or general headquarters and officered by efficient medical men and surgeons. They should be equipped with all modern appliances for emergencies, including ambulances and litters. Details should be made to accompany all troops ordered out for service and in

large concentrations they should be prepared to establish field hospitals.

The District of Columbia Ambulance Corps is in addition to its military duties held in readiness for sudden emergency calls in case of serious railroad or other disasters. In Massachusetts the same arrangement is in operation.

Officers of the Medical Corps should comprise the best men of the profession who can be induced to enter the service and sacrifice their valuable time for the State's benefit. National Guard surgeons whom the writer has met and served with are of that class and it is believed that such is the case with very few exceptions. A point which has been discussed considerably in some States is whether medical officers shall be attached to the permanent staff of regiments, as is the general practice, or be formed into a corps similar in organization to that of the army. While there are some objections to abandoning the present method, it is believed that the corps organization possesses advantages which would make its adoption desirable.

The State should furnish compact and practical medical chests and operating cases. In several States the medical chests are kept in the possession of reputable druggists, who contract to keep them freshly supplied and replenished, and ready for use at a moment's notice. This method would do away with a common cause of complaint found in surgeons' reports, that the medicines were so old as to be of little value.

Every body of mounted troops should have the services of a competent *veterinary*. He should, if possible, inspect horses before they leave their home stations, and reject all showing weakness which would disqualify them for hard service. This method will be found to save the State in the end considerable money which might otherwise have to be paid owners for injuries incurred in service when possibly the animals were not sound and fit for duty before being taken.

Many States make no provision for special *commissary officers*. This is safe enough for ordinary times and encampments, when the quartermaster is not overburdened with work and has plenty of time to attend to feeding the troops, but sudden calls into service bring about a very different state of affairs. Then the quartermaster finds himself up to his ears in his own special duties and another staff officer is needed for the commissary department, who should have had training in that branch of work.

The folly of appointing *staff officers* of any kind for social, political, or any other than military reasons, is nowhere so clearly demonstrated as when troops are called into service. Quartermasters who know little about transportation, camping and supplies, commissaries who could not tell the amount and value of a ration; brigade, division and governor's staff officers who know absolutely nothing of the duties indicated by their titles; these are all too common, even in some of the best States. The remedy for this is of course to appoint men to those positions who are known to be fitted for them and on the score of fitness alone.

Cases of this kind which occur on the staff of nearly every governor, should be prevented by a law requiring a reasonable term of military or naval service, at least three years, from any person considered in connection with such a position. This would do away with the spectacle so often seen of staff colonels in full uniform with no previous training to enable them to wear their clothes like soldiers, officers whose commissions were perhaps rewards for electioneering services, social or financial position, or anything but the proper and common sense reason—military ability. One governor recently carried the thing to actual absurdity by appointing his fourteen-year old son a colonel on his staff. How better could the value and dignity of commissions be lessened and what would the silver eagles mean to a real soldier of long service, obliged to serve with such "colonels"? As a matter of fact, the governor's staff of nearly every State is out of all proportion to the actual needs of the service and a large reduction in the number of "butterfly colonels" would tend greatly to improve the dignity and efficiency of those remaining.

In organizing into *brigades* and *divisions*, there is a strong temptation to create too many commands of high rank. Some State organizations are inclined to be top-heavy. At the time of the riots in California, in July, 1894, the troops of that State had a governor and Commander-in-chief, Adjutant-General with the rank of brigadier-general, major-general commanding the division, and six brigades numbering in all 5300 men, only one brigade being large enough to merit that designation. This organization gave to a force of about 950 men sent to Sacramento, one major-general and two brigadier-generals with the Adjutant-General sending orders from headquarters, which fact was largely responsible for the failure of the troops to accomplish anything at

that point. A board of officers on reorganization has since recommended a reduction to three brigades.

The present arrangement in several States of more than one brigade, but no division organization or commander, leaves the force in case of a general mobilization with no permanent head; and yet a division commander, with a State Adjutant-General above him over whom he has no control and from whom emanates orders for the movements of his division, is in a rather unsatisfactory position. With civilian Commanders-in-chief, the Adjutant-General is now practically the military commander. It would seem that he should either be subordinated to the military commander, or the latter office abolished and the Adjutant-General given actual command. These difficulties have actually been met with in cases included in the record, which is the writer's excuse for touching upon the subject.

A subject which has been mentioned in the reports of several officers is that of *independent organizations*, over which the State has no control. In some States they are not allowed at all, in others only under certain restrictions, while in a few there are no laws regulating them and they flourish without limit. In many cases they are composed of men who desire the pleasure and display of military life without being willing to endure the work and responsibility. A few are organized with objects in view which are unlawful or inimical to the best welfare of the community. In nine cases out of ten such corps injure and detract from the strength and dignity of the National Guard. The regularly organized State troops should be the only armed military body allowed to exist by State laws, except associations of genuine veterans of the army, volunteers or militia. More than one instance has occurred where the arms of an independent organization have been found in the hands of a mob.

A plea is made here for a more permanent tenure of office for superior State military officers, especially the Adjutant-General. The common practice of introducing politics into the military department is all wrong without a single logical reason in its favor. A good Adjutant-General, of all others, should be retained in office regardless of his politics. With him rests largely the efficiency of the force. To remove division and brigade commanders, inspecting officers and the like and make their positions rewards for party service or berths for junior officers of the desired political faith, is one of the greatest pieces of folly a gov-

ernor could perform who has the welfare of his State at heart. And yet it has been done in several notable instances. All military officers should hold their positions during good behavior and upon this principle the efficiency and stability of the service largely depends.

Armories should be planned and constructed with reference to their fitness. They should be judiciously located in large cities particularly, be capable of defense by a small force, and be habitable for troops who are liable to be held in them with no convenient means of outside communication. To answer this latter requirement, cooking facilities are absolutely necessary. Every good armory should contain a kitchen. Whenever possible each building should have a tower or high roof which could be used for a signal station. The practice of locating armories over markets or in buildings not exclusively used for military purposes is to be avoided.

CHAPTER II.—IN SERVICE.

Study of the ten years' record presents very forcibly many valuable points on the actual calling into service of troops. It shows the *folly of delay* until the trouble has assumed such large proportions that many more troops are necessary and at much greater expense than would have been the case if done sooner. It shows the advisability of ordering at the outset a strong force, both for the moral effect and for lightening the duties and hours of service of the men. In many cases the mere display of a strong force in time will prevent trouble entirely.

Taught by the lessons of the Court House riot of 1884 in Cincinnati, on the probability of rioting during a labor strike in the same city in May, 1886, the governor ordered five regiments and three batteries into camp near the city, and additional regular troops were stationed across the river at Newport Barracks. Naturally there was no outbreak and the cost was certainly no more than if trouble had occurred ; leaving out the probable destruction of life and property, it was much less.

As an instance of bad management the following case is cited. After dallying for several weeks, the Governor of Tennessee in July, 1891, sent a force of 100 militia to reëstablish a convict miners' camp at Briceville. They were met by a force of about 2000 determined free miners and forced to retire without having accomplished their object.

In all cases calling for the use of troops the trouble should be checked decidedly at the outset, to do which will require the prompt employment of a strong force.

By prompt and judicious use of the State troops the Governor of Virginia is able to boast that during the years 1894 and 1895, no lynchings have occurred in that State, a statement which cannot be made by many governors south of that imaginary line which some people consider so real, nor by some executives north of it.

Orders issued for mobilization should be clear, concise and explicit. They should give all necessary details as to time and place, rations to be carried and other points suggested by the circumstances. Commanders of artillery and cavalry and mounted officers should be notified if horses are to be brought, if they are to be furnished at destination, as is sometimes done, or if the commands are to be dismounted. The method in some States is to notify company commanders by wire direct, at the same time instructing regimental commanders to assume command, thus saving considerable valuable time in emergencies, especially in regiments whose companies are scattered. In some cases it is considered safer to issue orders calling out companies, by name of town or city where located instead of by company letters, to avoid mistakes in transmission over wires, which have sometimes occurred.

For instance, the following order was issued to Col. Bennitt, 3d Ill. Infantry, in June, 1894:—"Proceed to La Salle with five companies of your command, namely:—Companies at Joliet, Ottawa, Streator and Aurora. Obtain special train, report to sheriff of La Salle County and act under his directions in preserving the peace. Company at Streator has been ordered to report to you at La Salle early to-morrow morning."

When troops are ordered held under arms in anticipation of despatch to another point, the commanding officer should arrange to have a special train ready to move on short notice if the case is urgent.

A very good "*transportation report*" is required from company commanders in Illinois, of which the following is an illustration: "Company C, 4th Infantry, stationed at Carbondale. Orders received 8 P. M., July 3, 1894. Ready to move 10 P. M. Time, 2 hours. Left on Ill. Central R. R. 4 A. M., July 4. Arrived at Mounds 6.45 A. M. Time, 2 hours 45 minutes. Distance trav-

elled 48 miles. Strength of company, 3 officers, 41 men; total, 44. Present for duty, 3 officers, 40 men; total, 43. Percentage 97. Left Mounds July 6 at 4 P. M. Arrived home July 6, 6 P. M."

The subject of *transportation* is one deserving considerable attention. All officers should familiarize themselves with the best methods of reaching certain important points and keep posted on time tables and connections liable to come into use; also what steps are necessary to procure special trains for emergencies. When a company or regimental commander has been ordered to report with his command at a certain place and time, it is his duty to "get there" regardless of obstacles. He would be justified in seizing transportation if refused him, taking steps of course to insure proper payment to the owner. A case is on record in Illinois of a colonel taking possession of a train and running it with men selected from his own regiment in order to be at a critical point as soon as possible. A captain in Ohio for whose company there was no regular train, or means of obtaining a special, in order to enable him to join his regiment, marched his men all night to a station on another line and succeeded in his object. Those officers and many others can be considered as good soldiers, having accomplished what they were ordered to do in the face of obstacles which would have caused others to fail. It was that quality which Stonewall Jackson looked for in selecting staff officers, viz., the ability to accomplish results regardless of circumstances. Transportation by wagons for infantry has been found valuable in many cases where haste was required, as in the case of companies not located on railroads, and troops leaving a railroad line to strike off into the country. In some of the Western States pack animals could be used to advantage for supplies and equipage.

It seems a good plan in a State where the troops are liable to be out in force, to have some officer, either detailed or permanently, as master of transportation. This was done in Ohio, in June, 1894, and in Indiana in May of the same year. In the former case a colonel, the whole of whose regiment was not in the field, was detailed for the position, while in the latter a prominent railroad superintendent was appointed for that special work with the rank of colonel.

Concentrations of troops for active service should be so arranged if possible as to have them arrive on the ground at an unexpected

time and from an unlooked for direction. It is not best to give plans of such movements to the press before their execution, as cases have occurred where such action prevented the accomplishment of the design, by warning the rioters of the exact movements intended and enabling them to do more damage and escape before the arrival of the troops. An example of a well planned and well executed concentration is that at Homestead, Pa., in July, 1892. The two brigades, fully equipped, were in possession of the town before the inhabitants and strikers were aware of their arrival, having disembarked at an unexpected point at an early hour.

A fine illustration of "how not to do it" was presented at Sacramento, Cal., July 4, 1894. Troops were ordered from San Francisco with rations. They arrived without rations and short of overcoats, blankets, haversacks and canteens, all of which were needed, but which the State had neglected to furnish in sufficient quantity. By unauthorized instructions the train was stopped at a point not contemplated by the commanding officer, who, however did not insist on carrying out his original plan. Valuable time was lost in an attempt to obtain breakfast for the men, without complete success, it being a holiday and the stores closed. Headed by the local troops the column then marched to the railroad station, to seize which the expedition was organized, but ran up against a dense and good natured crowd in front of the building. "Not being able to force a way through" the men were kept standing there in the hot sun for three hours until about one sixth were overcome by the heat, the crowd meanwhile mingling with the soldiers. While this was taking place at one end of the station, the other end was completely clear and could have been entered at any time, but for lack of coöperation between the two brigade commanders.

To cap the climax the major-general commanding, having reported to the U. S. marshal, a civil officer, and considering he had thereby turned over the actual command of the troops to the latter, left the scene and returned to San Francisco. The marshal withdrew from this dangerous position the troops which had not already left of their own accord, and later on refused permission for them to sleep in the station on the ground that the strikers might not like it. This case teaches, among many other things, *the advisability of not using local troops*, in some cases, when others are available. To the credit of the California National Guard it should be said that at all other times and places

where on duty during the campaign they performed excellent service, and that the failure at Sacramento was due entirely to the incompetency of superior officers. It was very fortunate that they did not have the conditions to face which existed in Pittsburgh in 1877, as the results would very likely have been equally disastrous.

Several important lessons relating to the dispatch of troops to distant points can be gathered by a study of the record. Commanding officers should be provided with *maps* of the district in which they are to act, if they are unfamiliar with the locality, such maps being difficult to obtain when wanted and their absence liable to retard the work of properly distributing the force.

Artillery and machine guns should always be provided with an *infantry or cavalry escort* when liable to come in contact with crowds in moving to join the main body. Two cases are mentioned when a neglect of this came near causing trouble, one at Homestead and the other during the Brooklyn street car strike in January, 1895.

The disposition and handling of troops while in the vicinity of or in actual contact with mobs, is a subject for which no general rules can be made, requiring good judgment and depending largely upon circumstances. Experience seems to show that it usually is best for the military to assume the offensive at the outset. The generally accepted theory among officers is that while the military commander is obliged to report to the civil officer and receive general directions from him as to the work to be done, the method of performing that work rests with the soldier. The commander must be determined, fearless and independent. He should permit no discussion or temporizing with law breakers, either by himself or his subordinates. The California code prohibits officers from *making speeches to rioters*, which, however, did not prevent a brigade commander from doing so at Sacramento.

It has been a not uncommon occurrence for railroad strikers to draw coupling pins and throw switches in the immediate vicinity of troops guarding trains or being transported in them. The following quotation from the report of Col. Culver, 5th Ill., on the Danville riot in July, 1894, will give a clue to the proper method of action in such cases: "I have charged mobs six or eight times, but never with loaded pieces, depending entirely on the bayonet or sabre. With 500 men on duty and 40 rounds to the man issued, there has not been a gun loaded, with the excep-

tion that all engine guards were under command of a commissioned officer with instruction to load after they were on the engine. The officer was always accompanied by a railroad employé who had authority to open and close switches. The officer in command of such guards had my orders to fire by sections (four at a time) on any striker or unauthorized person throwing a switch in front of such engine, and in case the first section did not kill, the fire to continue until they got their man. Throwing a switch in front of a moving train, I assume, is an act of war, and is as liable to cause loss of life as the firing of a gun or any other act endangering the lives of men. Although it has been a common means of mobs to delay trains and injure troops and railroad employés, it will not be done with troops under my orders. All such train guards draw cartridge as soon as on the ground, and under no circumstances, load again without orders."

In dealing with mobs commanding officers should bear in mind a clause in the Massachusetts' regulations that "The only eventually merciful measures are the severe ones." Avoid firing as long as possible, but when that contingency is imperative, instruct the men to aim low, as firing high or over the rioters' heads is pretty certain to kill innocent persons at a distance. The folly of using *blank cartridges* on such occasions seems to be quite generally recognized. The main reliance of infantry in dispersing mobs should be the *bayonet*, which has been found very effective for such work. Col. Culver says: "The standing orders to the company commanders were to avoid injuring them (the rioters) unnecessarily, but in case it was necessary, to use the bayonet freely on their limbs."

The time *when firing becomes necessary* usually has to be decided by the military commander, although in some States this rests with the sheriff or other civil officer to decide. The following order, issued to the army, at the time of the Chicago riot in 1894 is of considerable interest in this connection:

General Orders No. 23:

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
WASHINGTON, JULY 9, 1894.

The following instructions are published for the government of the army: A mob, forcibly resisting or obstructing the execution of the laws of the United States, or attempting to destroy

property belonging to or under the protection of the United States, is a public enemy. Troops called into action against such a mob are governed by the general regulations of the army and military tactics in respect to the manner in which they shall act to accomplish the desired end. It is purely a tactical question in what manner they shall use the weapons with which they are armed—whether by the fire of musketry and artillery or by use of the bayonet and sabre, or by both, and at what stage of the operations each or either mode of attack shall be employed. This tactical question must necessarily be decided by the immediate commander of the troops, according to his best judgment of the situation and the authorized drill regulations.

In the first stage of an insurrection lawless mobs are frequently commingled with great crowds of comparatively innocent people, drawn there by curiosity and excitement and ignorant of the great danger to which they are exposed. Under such circumstances the commanding officer should withhold the fire of his troops, if possible, until timely warning has been given to the innocent to separate themselves from the guilty. Under no circumstances are the troops to fire into a crowd without the order of the commanding officer, except that single sharp shooters, selected by the commanding officer, may shoot down individual rioters who have fired upon or thrown missiles at the troops.

As a general rule the bayonet alone should be used against mixed crowds in the first stages of a revolt. But as soon as sufficient warning has been given to enable the innocent to separate themselves from the guilty the action of the troops should be governed solely by the tactical considerations involved in the duty they are ordered to perform. They are not called upon to consider how great may be the losses inflicted upon the public enemy, except to make their blows so effective as to promptly suppress all resistance to lawful authority and to stop the destruction of life the moment lawless resistance has ceased. Punishment belongs not to the troops, but to the courts of justice.

By command of

MAJ. GEN. SCHOFIELD.

GEO. D. RUGGLES, Adjutant General.

A great deal of forbearance has often to be exercised by officers, in cases especially where the people, although acting in a

lawless manner, are still not violent or particularly aggressive, as in the Brooklyn street car strike of January, 1894. Here nearly everyone was at first in sympathy with the strikers and many joined in the work of obstruction, and yet to have fired upon them would have been little short of murder. The troops gave a fine exhibition of patience under very trying circumstances. The duties of the military are often very delicate to perform, as in cases of political disputes, "county seat wars" and some others, where both parties may appear to have equal rights, the decision of right or wrong being left to the courts later. In other cases this element does not appear and a policy of "stern repression" becomes necessary.

One of the best illustrations in the list of the proper use of fire-arms occurred at Milwaukee in May, 1886, when a mob of foreigners marched to attack and destroy a large manufacturing establishment. The commanding officer of the troops stationed there, after giving them fair warning of the consequences, ordered his men to fire, which was done with telling effect and practically finished the riot. There is no case on record during the ten years where a mob stood up to receive a second fire, the first being always effectual in dispersing them.

Troops in the vicinity of a mob should if possible *avoid close contact* with the crowd. A marching column should clear the full width of the street ahead of it, and be preceded by a skirmish line if practicable. Observance of these principles would have prevented the terrible loss of life at the Haymarket in Chicago in 1886. The police were advancing in column of platoons to disperse the Anarchist meeting when a bomb was thrown from the crowd and exploded between the first and second platoons, killing and wounding between 35 and 40 men. Another instance of a disregard of proper precaution occurred at Lemont, Ill., in May, 1885, as the following will show: "The mob met the main front with clubs and rocks. As the troops advanced steadily the mob gave way to the side of the street and hurled a shower of rocks."

In Brooklyn January, 1895, the troops were much annoyed and their lives endangered by missiles thrown from windows, whereupon an order was issued directing citizens to keep away from windows and off of roofs during the passing of troops on penalty of drawing their fire, and several innocent but curious persons had narrow escapes as a result of disregarding the order;

one man supposed to be on a roof with hostile purpose was shot and killed.

In the *disposition of troops for city work* it is best not to divide the force too much. The most effective plan seems to be to *establish a camp* at some central or strategic point and send out large detachments to special points requiring their presence. This method may require the employment of a larger force than might otherwise be used but will probably be found safer and more satisfactory. It is sometimes advisable to locate this camp just outside the city, where the facilities for comfort are greater. Circumstances sometimes require the sending out of strong *patrols* to prevent the gathering of crowds and to ascertain the condition of affairs. This work demands good, self-reliant officers.

Officers on patrol and reconnaissance duty should gain sufficient information to make *sketch maps* of the ground covered. *Night patrol duty* is especially important and dangerous. *Flanking movements* from unexpected directions should take the place of direct attacks when practicable, being often more effective and attended with smaller loss to both sides. *Barricades* have been little used in this country but are liable to form an important feature in some future riot led by men who have received their training in European capitals. They should be turned if possible instead of attacked from the front. A noted leader of the Paris Commune directed his men to construct them not so much for defense as to impede the progress of troops and enable them to be fired at from windows and roofs.

Outpost duty is of frequent occurrence in large riots. Men detailed for this work should be thoroughly equipped and rationed. It is often advisable to substitute for single sentinels, *pickets* of two or three men, especially at night.

In cities disturbed by riotous assemblages, *all liquor saloons should be closed* by order of the civil authorities, to prevent their use by both rioters and soldiers. In Alabama the power to do this is given to the military commander. In all cities there are a great many important points requiring protection, such as public buildings, gas, water and electric light works, gun stores, arms issued to schools, storage places for explosives and other points occurring only in special cases. In eastern Ohio, in June, 1894, it was found necessary to *guard the water supply* used by the troops on account of threats of using poison, made by the rioters.

A very annoying practice in a few cases on record was that of *stretching wires* across the streets after dark to trip the soldiers hurrying to quell a mock disturbance. This, and the possibilities of danger from the use of telegraph wires and poles felled to form an entanglement suggests the carrying of wire cutters by all troops, the use of an engineer organization and to strike at the root of the trouble, *the burying of all wires in conduits.*

In guarding a jail or other building liable to attack, the best plan seems to be, if the size of the force allows, to establish a cordon or line of pickets at some distance away, holding the main body in or adjacent to the building. The increased use of troops in small bodies emphasizes the importance of *training non-commissioned officers to be self-reliant.*

Mining and railroad troubles are among the hardest to handle, involving the use of so many detachments and the covering of so much ground with a limited force.

The *use of cavalry*, either mounted or dismounted, is to be strongly recommended in riot work, judging from the numerous successful cases in the record. The effective employment of that arm is well known in Europe for duty of this kind, but it is not necessary to look across the water to find precedents for it. The following is an extract from the *Army and Navy Journal's* account of the Milwaukee riot in May, 1886, referring to the work of the Light Horse Squadron of that city, which with two companies of infantry was under command of Col. Chas. King (captain U. S. A. retired). "They (the rioters) had fired on the police and driven the chief and his men to bay, but the squadron rode through them with perfect ease, and in five minutes the colonel was able to report the crowd driven back a block in every direction, from the threatened position." Of the cavalry at Danville, Ill., in July, 1894, Col. Culver, 5th Illinois Infantry, says: "Capt. Butler's troop (dismounted) arrived at this time and spanked this crowd with their sabres as long as two remained together." (A message sent to a crowd at another point, some of whom had been in the first assemblage, that they would be treated in the same way, was sufficient to disperse them before the arrival of the troops.) "In my judgment the Danville service has fully demonstrated the value of cavalry dismounted in driving ordinary mobs, and when properly commanded and disciplined, as Troop B, of Bloomington, is, the sabre is a much better weapon to punish them with

without loss of life than the bayonet; mounted, they are even more effective, and almost irresistible by an ordinary mob, but much more likely to kill (when it is only intended to punish and disperse a mob) than on foot. Capt. Butler has demonstrated to my mind the value of this arm in riot duty."

Brig. Gen. Welch, commanding the 3d Illinois Brigade at Chicago soon after, says: "The service rendered by Cavalry Troop B was of particular value, and in my opinion the cavalry arm of the service should have more attention in the future." The effectiveness of the regular cavalry at this same time is too well known to require more than an allusion to it. Major Gen. Dimond, commanding the California National Guard division says in his report: "The services of the cavalry at Oakland were of the utmost value in dispersing crowds and in the performance of patrol and picket duty."

The employment of the *Naval Militia* in the line of its particular duties has occurred in but few cases. In fact the writer can find no case where the work performed by that force could not have been done just as well by other branches of the service. Although several instances have occurred where this force has been on duty, the only cases in which it had to deal with water problems were at Fire Island, N. Y., in September, 1892, during the cholera quarantine; at Chicago in July, 1894, where it guarded the water works and crib, and at Oakland, Cal., in the same month, where it did some duty on the water front. In other cases it acted as infantry or artillery.

In the Massachusetts regulations there was formerly a clause advocating the *use of a fire engine and hose* in dispersing mobs. This always seemed to the writer a rather impractical suggestion, until he found records of three cases of the kind in the past ten years: one in Manistee, Mich., May 4, 1889, troops being also present; another in Passaic City, N. J., March 8, 1892, when without the use of military force, a body of railroad laborers who were attempting to tear up a highway crossing, were effectually prevented by a good wetting. The third instance occurred at the recent terrible and needless panic at the Front Street Theatre, Baltimore, Dec. 27, 1895, when twenty three people were crushed and trampled to death. A frantic crowd of Russian and Polish Hebrews fought like wild animals to get into the building in order to rescue their relatives and friends, greatly hampering the efforts of police and firemen. A cool headed district fire chief,

by turning the hose on them, accomplished what the clubs of the police were unable to do.

The *supplying of troops in the field* with quartermaster, ordnance and commissary stores is a subject which calls for a great deal of careful preparation and thought. Soldiers must be clothed, housed, armed, and fed properly and promptly to enable them to do good work. All articles of equipment needed for immediate service should, of course, be in the possession of the troops at all times. Tents, camp equipage and anything else needed for long service, can be stored at some central point or points and issued when wanted. This method was carried out very successfully in Illinois in 1894, when troops were ordered all over the State at different times. The central depot was located at Springfield, from which when necessary, tents and other articles were forwarded by rail in charge of an officer, arriving at the scene of action as soon after the time of arrival of the troops as possible.

In investigating the *Subsistence* question, the first point which presents itself is the absolute necessity of all troops ordered on duty taking with them sufficient food, either cooked or raw, to last until the commissary department can get into working order. Lieut. Wilkins, 6th U. S. Infantry, on duty with the Iowa National Guard, says of the service in 1894: "Troops ordered on riot duty should invariably take forty-eight hours' rations (imperishable), bacon, hard bread, coffee and sugar. These can be disposed of or returned if not used." Also: "The experience of this tour showed clearly to the companies the necessity of having a complete mess outfit, and of taking at least twenty-four hours' rations whenever ordered on duty of this kind. It showed clearly the benefits derived from having company messes in camp. Each company was self-sustaining, and had ample, well-cooked meals, on time. If the contract or general mess system had obtained in the yearly camps, this large body of men would have been at as great a disadvantage as troops in other States have been under similar conditions. The health of the command was excellent. The only serious case on sick report was caused by eating canned beef; and in this connection I would say that while canned meat may do for export, I do not regard it as the proper ration for an Iowa soldier."

The Pennsylvania troops ordered to Homestead in July, 1892, carried three days' rations. A few States have established an

"*emergency ration*," commanding officers being required to make such arrangements with dealers as to insure prompt delivery on a sudden call.

These are extracts from an order issued in Tennessee: "The following ration is hereby adopted as an emergency ration per day:

For a company of 40 men:

40 lbs. of hard or soft bread, average 1 lb. per man.
40 lbs. of corned beef or bacon, average 1 lb. per man.
6 lbs. of coffee, average 3 ounces per man.
10 lbs. sugar, average 4½ ounces per man."

"Travelling on cars only the regular allowance of hard or soft bread and corned beef in tin cans can be purchased. Liquid coffee can be purchased, not to exceed three pints (or 21 cents per day per man). This can be supplied at regular stations, by conductors telegraphing in advance." The Massachusetts emergency ration is as follows: For a company of 60 men: Hard tack, 60 lbs., average per man 1 lb.; luncheon or corned beef, 60 lbs., average per man 1 lb.; coffee, 11¼ lbs., average per man 3 oz.; sugar, 15 lbs., average per man 4 oz.

It is best to make the troops *entirely independent* of local hotel and restaurant keepers, who may be in sympathy with rioters or afraid of them and refuse to cook for or supply the military. Even if they are willing to do so, it is much more expensive that way. Owing to lack of a proper commissary system in New York and neglect to carry rations, the force sent to Buffalo in Aug., 1892, was subjected to much hardship and obliged to live at first on what could be picked up from storekeepers often hostile to the troops. At Sacramento, in July, 1894, an entire absence of cooking utensils and commissary arrangements forced the troops to live at hotels and restaurants for eight days, at a heavy expense to the State.

Supplies in bulk can usually be procured near the field of action. If not, they can easily be shipped from some more distant point. In urgent cases a commanding officer would be justified, upon refusal to sell, in seizing the necessary articles, giving receipts therefor. There are very few dealers, however, whose antagonistic sentiments would be sufficiently strong to neutralize their desire to make money. Food supplies should be purchased in open market if possible. Fresh meat, vegetables, fruit in season, are all desirable things to have. Asst. Surgeon Bevans, 5th Ill.

Infantry, says: "Pickles were insisted upon, for I find that they do more to keep up an appetite and help digest food than any article used in the camp."

The *cost of rationing troops* in the field, according to reports of various commanding officers and commissaries, ran from nineteen to forty-two cents per man per day, cooking and serving being done by the men. A fair average of all the cases noticed would be thirty cents, under ordinary circumstances. To do this *a knowledge of elementary cooking* is required of the men, or else cooks must be regularly enlisted. Theoretically every soldier should know how to cook for himself, as he is liable to be left out on picket some time with his haversack full of raw food and the company cook several miles away. There are very few men who have not sense enough to make coffee and fry bacon after seeing it done once, but it is probably best to have it shown them before it must be put in practice. Camps of instruction and route marches are excellent opportunities for doing this.

It seems to be generally admitted that the *company mess system* is the best fitted for active service. A battalion or regimental mess may be all right for camps, but when a company finds itself on outpost or detached duty with the kettles and other utensils left behind in camp for the benefit of the other companies, a change of plan is necessary. The Buzzacott field-oven seems to have given considerable satisfaction whenever a portable and compact oven was needed.

Pay.—Men who are liable to be called upon at any time to risk their lives in enforcing the laws of the State and in protecting its interests, should receive for such service performed a fair and fixed remuneration. One would naturally think it would be difficult to find any one to disagree with this statement. On the contrary we find several States in which there is no provision for paying troops for active service. In some cases the National Guard have responded promptly for duty only to find after its performance that the State they served expected them to give their time and services for nothing. In other instances the law has been so defective that suit had to be brought against State or county to secure the pay. Within a few years the spectacle has been presented of governors going into their own pockets to pay the troops pending special action by the succeeding legislatures to cover the cases. In one State the necessary funds were advanced by the banks in order that the men need not wait sev-

eral months for their money. Provision should be made by law for the *prompt payment of troops for service*, either from regular appropriations made for such emergencies, or by authority given the executive. The payment in the field of troops on duty for short periods is of doubtful expediency, although when in service for any length of time it may be advisable.

The *legal questions* brought up by a call for troops for active service are varied and oftentimes apparently intricate. All military officers should know, to begin with, *what civil officials have authority to call out their commands*, this varying considerably in different States. They should also know what duties they can legally perform when called out. Some States require the actual presence of a civil officer at all times to enable the troops to act at all, which appears somewhat ridiculous when it is considered that the sickness, death or intentional absence of a sheriff would put a stop to all military proceedings. Another point which came up in California in 1894 was that troops called out on requisition of a county sheriff could not pass out of that county in guarding trains because the sheriff of the adjoining county had not seen fit to make the same request, although the need for military assistance may have been as great as in the other county.

The Governor of Illinois, in his orders to troops in 1894, stated "that it is not the business of soldiers to act as custodians or guards of private property. The law authorizes them simply to assist the civil authorities in preserving the peace, quelling riots and executing the law. Whenever troops have been and may hereafter be ordered out and the owner of property feels it necessary to have it guarded, he must do so at his own expense, and in such case troops can be used only for the purpose of promptly quieting the disturbances of the peace or suppressing a riot, or in some way enforcing the law."

The writer of these notes doubts if this view of the question will be concurred in by all officers, as it would often prevent the proper guarding of large manufacturing establishments, and would encourage the use of private armed forces similar to the Pinkerton guards, the use of whom precipitated the bloodshed at Homestead. All officers should be thoroughly familiar with the law of their respective States relating to the use of the military in aid of the civil power.

The declaration of *martial law* is of rare occurrence, placing

as it does the chief military officer on the ground in supreme command, the civil authorities retiring from active participation in the trouble.

Every State should have upon its statute books a law imposing a severe penalty upon employers who discharge their men on account of absence from business for military service, and the law should be rigidly enforced. It would seem as if merchants and corporations would recognize the necessity of maintaining and encouraging the National Guard, but unfortunately for the service one of the greatest obstacles officers have to contend against in attempting to bring their commands up to a proper condition of efficiency to defend the lives, property and interests of these same employers, is continued and obstinate refusal to let their men off for parades and encampments. Most people think that a street parade is only for show and of no practical use. On the contrary it is one of the best ways to shake a regiment together and get the companies to work in unison, especially in regiments whose companies are scattered, and is a great help to discipline.

It seems only reasonable to claim that each State should so protect its officers in the performance of their duty in a way which would prevent such cases as that recently seen in Ohio. To prevent the mob at Washington Court House in October, 1894, from forcing the jail for the purpose of lynching a prisoner, the troops were obliged to fire into the crowd, causing loss of life among the citizens, who were greatly incensed at this action. Col. Coit, 14th Infantry, the commanding officer, was forced to submit to a trial, which only terminated Feb. 1, 1896, in his acquittal, thereby causing him great annoyance and necessarily financial loss and detriment to business, for doing what a careful investigation showed to be fully justified by the circumstances.

Capt. James Chester, 3d U. S. Artillery, in a recent article in the JOURNAL OF THE MILITARY SERVICE INSTITUTION, says of such cases: "The status of the soldier while assisting the civil magistrate, as viewed by English and American judges, is simply that of an armed citizen. Orders cannot relieve him of personal responsibility. It is a favorite delusion that the orders of the magistrate carry absolution with them for acts done in obedience thereto. But such orders could not save the militia officers of Pennsylvania from trial by the civil courts for acts done during

the Carnegie riots. That they were promptly acquitted only proves that the people as represented by the jury, were friendly; not that the laws recognized their military obligations, or the validity of the magistrate's mandate. Sending troops to report to the civil magistrate is simply cruel. Troops are no part of our civil government and they never should be used until the legal machinery has broken down and civil officers have taken back seats."

The writer cannot refrain from inserting here a few words to show that the use of *special police*, *deputy sheriffs* and *marshals*, sworn in for an emergency like a large riot, is ill advised, undesirable and often worse than useless. When it is known that troops are to be called out, the appointment of extra assistants to the civil officials, with no special training for their work, would much better be omitted. The arming of undisciplined and oftentimes irresponsible persons for the purpose of enforcing the law is not to be recommended when a good military force is available, and the actions of such men often not under proper control are liable to precipitate trouble which would not otherwise have occurred. Capt. Mair, 2d Illinois Infantry, in his report of service in Chicago, July, 1894, says: "The few policemen did their work well, while the conduct of the deputy marshals was such that they were of no assistance whatever, but rather a hindrance, and I have no doubt better work could have been done, with possibly less bloodshed, by their absence from the scene of trouble." The following quotation, relating to the switchmen's strike at Buffalo, August, 1892, is also interesting in this connection: "The calling out of the militia by the sheriff is generally commended, especially as his deputies proved practically worthless, and many of them deserted at the first show of opposition."

As to the *reliability of the National Guard for active service* there can be no doubt in the minds of those who will take the trouble to look into the subject. There have been very few cases of failure to promptly respond to calls and in good numbers. Of those instances which have occurred nearly all can be traced directly to the inefficiency of superior officers, a lack of proper support and instruction by the State authorities or the fact that the communities in which the trouble occurred were themselves not composed of citizens imbued with a proper respect for the law.

A few cases are cited here to show what proportion of strength can be depended on for duty at short notice. They are not picked out as the best, but taken at random from such data as the writer happened to have at hand. At the Stock Yards Riot in Chicago, November, 1886, the 1st and 2d Illinois Infantry with Troop E, 1st Cavalry, turned out about 90 per cent. For the Buffalo railroad strike in August, 1892, about the same proportion reported. The Homestead troubles, July, 1892, brought out 91.56 per cent. of the enrolled strength, several organizations having 100 per cent. present for duty. During the coal miners' strike in Indiana, June, 1894, 82 per cent. of the organizations ordered out were in the field, while the force at Hammond the next month during the railroad troubles came up to 90 per cent.

The 4th and 5th Maryland went to the Frostburg mines in 1894 on six hours' notice with 93 and 91 per cent. respectively, which was increased the next morning to 95 per cent. The coal miners' strikes in Illinois, in June, 1894, called into service 84.8 per cent. of the reported strength, while the Pullman riots in July of the same year found over 90 per cent. The 1st Illinois reported for this duty with 96.2 per cent. In July, 1894, the 6th California turned out 95 per cent. of its men in three hours. These figures taken as they are from widely distant sections of the country, ought, if known, to silence forever the silly talk about "play soldiers."

The large amount of hard service successfully performed in the last few years by the National Guard, ought to prove conclusively to any sensible man that this country has a body of active, healthy, patriotic young men, able and willing at all times to sacrifice their own interests and risk injury or death in support of law and order. The calling out of large bodies of troops in several States has done more toward making the service efficient by revealing defects of organization, administration and personnel than many years of study in the quiet of inaction. It remains for the authorities, civil and military, of those States in which trouble has not occurred to any great extent, to avail themselves of the practical lessons taught in the others and to so improve and foster their own troops as to bring them up to that condition in which all soldiers should be at all times, in readiness for active service, like the "minute men" of our New England forefathers.

In order to show that service in the National Guard possesses an element of danger not recognized by the ordinary citizen, the writer has endeavored to compile a list of casualties occurring among the troops during the ten years under discussion. Owing to incomplete records it is almost impossible to make a full list, but the following figures probably cover 75 per cent. of the cases and possibly more:

Killed in action,	10	
" accidentally, by fire-arms,	3	
" " " railroad trains,	3	
Drowned,	1	
Died of smallpox, contracted in service,	1	
" " yellow fever, " " "	3	
" " cerebral hemorrhage,	1	
		22
Wounded in action,	32	
" accidentally by fire-arms,	6	
" " " railroad trains,	8	
Sick with yellow fever, contracted in service,	3	
		49

A total of 71 cases.

There must necessarily have been a great many more slight injuries, not considered of sufficient importance to mention outside of medical officers' reports and also cases of sickness and death brought on by exposure to unusual conditions while in service. While these results can hardly be compared with those found in war, they are enough to show that the "play soldiers" are exposed to some risk and danger while on duty.

In concluding, the writer hopes that the above pages will give officers and men of the National Guard something to think and talk about, with the result of improving the force here and there in those places and methods which experience has proved weak. It is not to be expected that all will agree with the writer's deductions, but they may cause those who do not, to think for themselves and form their own opinions about subjects to which they may not have given much attention.

It has been a very interesting study to watch the development and improvement of the State troops as the need for them has increased. States which twenty years ago had no organized militia worthy of the name, have by their own bitter experience

or that of their neighbors, learned their lesson, and to-day have little armies in good fighting condition ready to spring out of civil life at a moment's notice in defense of State or Nation.

In justice to the Regular Army, which serves as a model for the National Guard, the help and advice given by officers detailed by the War Department and also by many others of their own free will in addition to their regular duties, must be fully recognized and credit given them for many reforms and improvements in the service. The old feeling of indifference and superiority formerly quite generally held by regular officers for the militia has largely disappeared by reason of closer acquaintance and rapid improvement in efficiency of the latter. Army officers with whom the writer has been brought in contact he has found to be nearly always interested in the service and willing to give advice and instruction which their more thorough training enables them to do. It is to be hoped that a closer union of the two services will eventually be brought about in the nature of a definite system, in place of the present desultory and incomplete method.

THE CENTRAL MILITARY ADMINISTRATIONS OF FIVE GREAT POWERS.*

By First Lieut. HENRY T. ALLEN, 2d U. S. Cavalry.

IN general there is imposed upon the Central Military Administration the direction of all branches of military administration, the supervision of the welfare of troops in all relations, and the control of the regular distribution of funds assigned for the needs of the army. In proportion to the size of the army and the complexity of military technique, there appears in most countries a tendency towards decentralization, to a freedom from the Central Administration in matters of detail by transferring them to the supervision of lower instances of line and local administrations.

It is not possible to give any specific instructions as to what questions should be entrusted to the lower organs of administration; that is a question of personal views and depends upon local conditions and the degree of confidence of the superior commander in the said lower administrations. Certain general subjects are, however, everywhere within the supervision of the Central Administration, such as: general orders concerning the *completion* of the army, the determination of its organization, the publication of general orders for its instruction and guidance, the development of questions relating to the organization of the matériel and its method of fabrication, the distribution of funds to

* The object of this paper is to outline a comparative study of the directing organs of several military systems. If the question were carried even partially into detail the limits of time and matter would be exceeded. I have therefore endeavored to present only the salient features of the central military administrations of Germany, France, Austro-Hungary, Russia, and the United States.

For more detailed study of the subject I would respectfully refer those interested in it to the following books which have been used in the preparation of this paper:

1. Armée Française. Lois, Decrets, Reglements, relatifs à l'organisation de l'armée, editée par Henri Charles-Lavauzelle.
2. Das Heerwesen der Oesterreich-Ungarischen Monarchie. Glueckmann.
3. History of the War Department. Ingersoll.
4. Organization of Armed Forces. Rediger. Oustroestvo Vooroujennoi Sely.
5. Coburn's Report.
6. The Command of the Army. Brevet-Colonel William M. Wherry.
7. Loebell's Jahrbuch.

procure the requirements of the army, the control of the action of the higher organs of line and local administrations,—finally, the supervision of the personnel of the officers, their promotion and assignment, in a word, those questions, the centralization of which is absolutely necessary for the maintenance of unity in the army and for the systematic disbursement of funds.

In peace it is very easy to overdo the control over economic operations in consequence of a desire to verify the regularity of even the smallest expenditure. Such a verification should undoubtedly take place, but in this connection an excessive centralization is dangerous and by no means results in economy, because the increased number of papers requires a larger clerical force the maintenance of which may exceed the savings obtained through the more rigorous control.

Decentralization in armies is, as a rule, in proportion to the decentralization in civil departments of the respective countries. The organization and operation of the central organ of military administration is in close dependence upon the condition of the nation and the system of its government. In general the strictest conformity to dispositions of War Departments may be expected in those countries where orders issue directly from the head of the nation or from the Minister of War directly responsible to him. On the other hand a complete guarantee in this direction is not probable where the complete authority is entrusted to a Minister of War, dependent upon a parliamentary majority, appointed and relieved according to circumstances, having for the most part nothing in common with military matters.

GERMANY.

In the formation of the German Empire the supreme command of all armed forces was given to the Emperor of Germany, King of Prussia, by virtue of the treaty of alliance of April 16, 1871. He was empowered to determine the strength, the organization of separate contingents, and the dislocation of troops, and likewise to establish regulations for their instruction. The Emperor has the right to inspect all the troops of the army; he appoints superior chiefs of separate contingents and the commandants of fortresses, all of whom swear allegiance to him. The appointment of other officers was left to the allied princes, but in the majority of cases, by reason of military treaties concluded with Prussia, this right has been ceded to the Emperor.

All military officers and officials swear allegiance to the Emperor with a clause of loyalty to their respective princes, or swear allegiance to the latter with a clause of subordination to the Emperor. The rights of the Emperor as regards different contingents are far from uniform. The position occupied by the kingdom of Bavaria in the empire is unique. Its troops in time of peace are exclusively under the authority of its king while the Emperor has the right only to inspect them. Having secured such independence for its army, Bavaria took upon itself the obligation to maintain the same proportion of troops as the other states of Germany, and to expend upon them a sum proportional to the other parts of the empire. The Bavarian troops are mobilized at the suggestion of the Emperor by order of the King, but from the first day of mobilization they are at the complete disposition of the Emperor. The Emperor by the same treaty is accorded the right to conclude in the name of the empire alliances and treaties with foreign powers with the consent of the Allied Council. He has the right to declare war in the name of the empire. The Allied Council consists of representatives of the governments of the separate states and contains 58 members. Of these 17 are from Prussia, 6 from Bavaria, 4 from Saxony, 4 from Wurtemberg, 3 from Baden, 3 from Hesse, 2 from Mecklenburg-Schwerin, 2 from Braunschweig, and 1 each from the other states.* The President is the Imperial Chancellor.

In case of an invasion or an attack on the coasts, no consent of the Allied Council is required. The relation of the Emperor to the contingents of the separate states is determined by special conventions concluded with each of them, partly at the time of the formation of the German Empire, partly after the formation of the North German Alliance. Saxony and Wurtemberg have their special troops with their own corps of officers, yet all Prussian orders and instructions are obligatory upon the troops of these kingdoms. Some of the other states† form separate regiments which however compose larger units with the Prussian troops, while their officers are appointed by the Emperor. The administration of the troops is entirely in the hands

*The German Empire consists of 25 states (4 kingdoms, 6 grand-dukedoms, 5 dukedoms, 7 principalities, and 3 free cities) and Alsace-Lorraine (Reichsland), which is really governed by Prussia and has no representatives in the Allied Council.

†Baden, Hesse, Mecklenburg, Oldenburg, Braunschweig, Anhalt, 4 Saxon dukedoms, and the 2 principalities of Reuss and Schwartzburg-Rudolstadt.

of Prussia and their maintenance proceeds from the same budget as that of the Prussian troops. Other states* have altogether renounced their right to form special troops of their subjects, and the recruits furnished by these states are enrolled in the nearest Prussian regiments. Thus under the complete authority of Prussia there are in time of peace 431,642 or 77½ per cent. of the entire army; under the *influence* of Prussia 39,409 or 7.1 per cent. Saxon, and 23,005 or 4.1 per cent. Wurtemberg troops. In addition to this there are the nominally independent troops of Bavaria consisting of 63,037 men or 11.3 per cent. From this we see that the Bavarian contingent constitutes one-ninth of the entire armed land forces of the empire.

In Germany there exists no general imperial ministries, and all affairs that would naturally fall within the province of such are directed by the Imperial Chancellor who is not responsible to the Chambers, but exclusively so to the Emperor. For the discussion of military questions of interest to the empire there exists in the Allied Council a commission for the army and fortresses the presidency of which belongs to Prussia. Representatives of the three other kingdoms must always be present. Members of the Commission, except those of Bavaria, are appointed by the Emperor. In the Allied Council, Prussia maintains a predominating influence; in all questions relating to the army and navy and likewise in the principal imperial funds, destined for the maintenance of the army, no change in existing statutes can be made without the agreement of the President, regardless of the majority of the Council. In the absence of an Imperial Ministry of War the Prussian one plays the rôle of such, but the Minister of War appears in the Chambers only in the capacity of a member delegate of the Allied Council and therefore not responsible to them. The absence of such responsibility makes the appointment of the Chancellor and the Ministers dependent exclusively upon the Supreme Power and not upon the struggles of the parties in the Chambers,—a fact that makes their tenure of office more stable and gives to the civil as well as the military administrations a more permanent character.

THE PRUSSIAN CENTRAL MILITARY ADMINISTRATION.

This Administration serves as an organ of the Emperor for the

* Principalities of Lippe, Schwartzburg-Sondershausen, Waldeck, Hamburg, Luebeck, and Bremen.

superior direction of the armed land forces of the empire. It supervises directly all branches of the army within the control of Prussia (77½ per cent. of the army) and issues the necessary orders to the higher administrations of the Saxon, Wurtemberg, and even the Bavarian troops, although by law the administration of the latter in peace time is entirely independent of Prussia. The Prussian Central Administration consists of three independent parts: 1, the Ministry of War; 2, the Great General Staff (Grosser General Stab), and 3, the Military Cabinet of the Emperor (Militaer Cabinet). The limits of authority of these three parts are not accurately defined by law; questions are divided between them according to direct instructions of the King who personally unites their actions and directs them to a common end. In general terms, the Ministry of War is entrusted with the supervision of all questions of law and expenditure. Within its authority repose all questions of organization and *completion* of the army and everything connected with military economy. Along with this principal organ of the Central Military Administration are two others which are specially engaged in working out military questions and formulating plans, which however they do not execute, but which they give to the War Ministry, where as said above are concentrated all legal and financial responsibility. On the Great General Staff is imposed the collection and tabulation of all information concerning foreign armies, the probable theatres of war, the supervision of transportation by water and rail, and the making of topographical charts. Upon the Military Cabinet is imposed the examination of all documents requiring imperial sanction, of matters relating to the superior command of the army (Obere Kommando-Angelegenheiten), and questions relating to the personnel of officers and officials, such as promotion, change of station, and decoration.

Besides these three principal divisions, there belongs to the Central Administration, general inspectorships of fortress artil lery, of engineers, and of military educational institutions; there are also inspectorships of cavalry and of field artillery. These inspectors and general inspectors report directly to the Emperor; there are other minor inspectorships, the chiefs of which report to the Minister of War.

1. MINISTRY OF WAR.

The scope of the Minister of War is seen from the above indications concerning the duties of the Ministry. He cannot, how-

ever, exercise any right of command whatever towards the troops because the highest chiefs—the commanders of corps and General-Inspectors are directly under the authority of the Emperor; moreover the personnel of officers is not subordinate to him. The Minister is authorized only to give the troops the necessary orders and instructions touching organization and economy, and then to secure an accurate execution of the regulations and orders issued. In matters of economy, the Minister has authority to assign funds within the limits of the budget; and in this sense he is restricted only by the subdivision of the latter into 39 heads with the knowledge that funds under one head cannot be used to cover expenses under another.

2. GREAT GENERAL STAFF.

At the head of the Great General Staff is the Chief of the General Staff who since 1821 has been under the immediate orders of the King. Prior to that time he was under the orders of the Minister of War. The reasons which caused this post to be made more independent are set forth by General Brousart von Schellendorff (Prussian War Minister from 1883 to 1889) as follows: "The Chief of the General Staff in time of war is intended to be the Chief of Staff of the Commander-in-chief. The observation of this principle is considered very important. By virtue of the rapidity of present mobilization it is necessary to appoint to this post a person already acquainted with all the measures and dispositions prepared for the outbreak of war, and for any other person too much time would be required to become thus acquainted. Besides, it would not be correct to entrust the execution of operations to a person other than the one who had prepared the plans of concentration of the army. For a successful execution in war time of the duties of the Chief of Staff of the Commander-in-chief, the Chief of the General Staff should in peace time enjoy great authority and should be independent of the Minister. It is possible, it is true, to make another combination: to appoint the Minister of War the Chief of Staff of the Commander-in-chief and to subordinate the Chief of the General Staff to him both in peace and in war time. This would not be expedient because 1, it is difficult to find a person combining the qualities of organizer, administrator, and leader, and 2, in war time it is not possible to remove the Minister of War from the execution of duties directly incumbent upon him. For these

reasons in Prussia the Chief of the General Staff is directly responsible to the Emperor and is exclusively occupied with the preparation for war, knowing that upon mobilization he must be charged with the responsible post of Chief of Staff of the Commander-in-chief. The nature of his occupations compelling him to continually think of the readiness of the army for campaigns, may in the course of time cause his views to be biased and may cause him to make demands surpassing the means of the state. Yet this onesidedness in many cases will be undoubtedly useful because all other organs of the Central Administration engulfed and partly suppressed by the mass of current work coming before the Chambers may easily fall into the opposite onesidedness. Marshal Bugeaud says: "On perd de vue dans la paix les éxigences de la guerre et on fait les armées pour la paix." The importance of the duties imposed upon the Chief of the General Staff makes it desirable that he remain longer in office and in this connection his independent position has proved very useful. With the exception of recent years changes in the chiefs have been very rare. In peace time the Great General Staff is charged with the following: the preparation for mobilization and the concentration of the army; the collection and tabulation of information concerning foreign armies and of probable theatres of war; the supervision of topographic and cartographic work; military historical and kindred work; collection of information concerning railways, their carrying capacity and so forth, also the transportation by them during peace. Besides that the Great General Staff works out questions of organization, plans of great manœuvres, and kindred problems.

3. MILITARY CABINET.

Thanks to the skillful organization of its armed forces—always the object of first importance to its kings—Prussia has grown and become powerful. They have directly commanded its army, always recognizing the corps of officers as the basis of its welfare; they have supervised the work necessary for the preparation of officers; and they have personally taken an interest in their promotion. In former times when the army was smaller most of the officers were acquainted with the King. With the growth of the army and the increase of the number of officers those relations were necessarily changed, and the estimate of the capabilities of officers at the present time is necessarily based

upon the certificates and recommendations of their chiefs. The increase of civil work also prevents the king from entering into details of questions relating to the personnel of officers. Still maintaining the traditions of the Hohenzollern family, the King reserves to himself the decision of these questions through the agency of his Adjutant-General, Chief of the Military Cabinet. Up to 1883 this official was to a certain degree subordinate to the Minister of War, but since that time he is under the immediate orders of the King. Therefore in Germany the person charged with the personnel of officers is independent of the change of War Ministers.

4. GENERAL INSPECTORSHIPS.

In Prussia there are an Inspector General of artillery, of engineers, and of military educational institutions; two inspectors of cavalry and one inspector of field artillery—all reporting directly to the king. There is also a General *Feldzeugmeister* whose grade is honorary. The General Inspectors of fortress artillery and engineers are the highest officials in respect to the special instruction of artillery and pioneer troops; besides that they take part in working out technical questions, and the Inspector General of engineers also supervises the construction of works. The inspectors of cavalry are not commanders of troops but are subordinate to line commanders and only work out cavalry questions, direct large cavalry assemblies, and inspect cavalry troops when ordered to do so. The inspector of field artillery directs its special instruction and inspects it during the period of practical firing.

CENTRAL MILITARY ADMINISTRATIONS OF BAVARIA, SAXONY AND WURTEMBERG.

Saxony and Wurtemberg have their Central Military Administrations organized according to the Prussian, but naturally on smaller scales. In these two kingdoms there is no establishment corresponding to the Prussian Military Cabinet, and therefore the personnel of officers falls within the domain of the Minister of War. In Bavaria the Minister of War is not only an administrator, but he is the highest chief of the army and of the general staff. He combines in his person the entire administration of the army and the command of the troops.

AUSTRO-HUNGARY.

In accordance with the division of the armed forces of Austro-

Hungary into 3 armies independent of each other—the active, the landwehr, and the honvéd, there are 3 Central Military Administrations—the General Imperial Ministry of War (Reichs-Kriegs-Ministerium) in Vienna and 2 Ministries of land defense (Landesvertheidigung), the Austrian in Vienna for landwehr and landsturm, and the Hungarian in Buda-Pesth for the honvéd. Each of these Ministries is independent of the other and is responsible to its respective parliament. Austria and Hungary have each a parliament of its own as well as special ministers. Questions of interest to the empire are decided by delegations composed of 60 members of the Austrian and as many of the Hungarian parliaments together with Imperial Ministers who are responsible to the delegations. Notwithstanding the above the Minister of War has succeeded in obtaining supremacy over both Ministries of land defense, although the Hungarians are generally very jealous of their independence. It would appear that there would be a great absence of unity in military questions but as all are subordinate to the Emperor the general unity is maintained. The Emperor has by constitution authority to promote officers and to confer decorations. Without his permission it is not possible to decide questions relating to the organization, instruction, clothing, equipment, armament, and economy of troops. The Emperor has a Military Chancellery (Kanzlei Seiner Majestaet des Kaisers und Koenigs) which examines reports of the 3 Ministries, makes assignment of officers, and confers decorations. This Chancellery being intermediate between the Emperor and the Ministers exercises great influence in military matters.

THE IMPERIAL MINISTRY OF WAR.

The Minister of War is the highest chief of the military and naval departments. He is not only an administrator as in Germany, but the entire permanent army and navy are under his command. He has at his disposition the operation of the budget, but is limited in this, that funds assigned under one head (there are about 30 in all) cannot be used for covering expenses under other heads. The Imperial Ministry of War, including the navy, consists of 5 divisions, as follows: 1, personnel; 2, organization; 3, technique; 4, economy; 5, navy. The first 4 divisions are subdivided into 15 sections, each in charge of a general, field officer, or high military official bearing the title of Chief of Section (Abtheilungsvorstand). In addition to these sections there

is a so-called "Praesidial Bureau," to which are entrusted secrets or specially important subjects; organization of the army; personnel of generals, field officers, and military officials of corresponding grade; also the publication of orders for the Imperial and Royal army. Besides the above there exists in the Ministry of War the following auxiliary organs: Chief of the General Staff, Inspectors General of infantry, cavalry, artillery, engineers, trains, and remount, commandant of sanitary troops, chief of the corps of medical officers, a committee on military hygiene, the Apostolic Vicariat, a statistical section, and the technical and administrative military committees. The first nine officers designated in the above are at the heads of their corps and arms. The Chief of the General Staff up to 1881 was subordinate to the Minister of War, but since that time his position has become more independent, and while he is under the orders of the Emperor, still all his reports pass through the Ministry of War who thus exercises a certain influence on his actions. Upon the Chief of the General Staff devolves all strategic work connected with the preparation for war; he takes part in the discussion of military and political matters relating to organization, armament, and mobilization of troops, the preparation of the *ordre de bataille* in time of war, the concentration of troops, the organization of military communications, and so forth. The corps of officers of the general staff and the railway and telegraph regiments are under his command. The general inspectors and the chiefs of the sanitary troops and of the medical corps have superior supervision over their special troops and inspect them by order of the Minister. They exercise no independent authority whatever, and must present all measures for the approval of the Minister of War.

THE CENTRAL ADMINISTRATION OF THE AUSTRIAN LANDWEHR AND THE HUNGARIAN HONVÉD.

In each of the two parts of the empire the superior administration of the Landwehr (honvéd) is entrusted to a minister of land defense who is at the same time the Commander-in-chief of the Landwehr and the honvéd. In Austria the Ministry of the Landwehr is divided into a praesidial bureau and 6 departments, including the administrative, gendarmes, and statistical departments. The personnel consists of landwehr officers and officials, some of whom are military and some civil. The inspector of gendarmes and the chief of the honvéd corps of officers are

connected with the Ministry. These ministers are entrusted with the personnel of officers under them and all matters relating to the economy of the troops; as commanders-in-chief they are responsible to the Emperor for the instruction of the troops and have the assimilated rank of corps commanders. The superior commander of the combined armed forces—active, landwehr and honvéd—is, as indicated above, the Emperor.

FRANCE.

In France the superior command of the army is by law imposed upon the President of the Republic, but by parliamentary statutes the real head of the army and the chief administrator is the Minister of War. The Central Military Administration consists of the Minister, the Cabinet of the Ministry, the General Staff, eight departments (directions), and the interior service. The Cabinet comprises three bureaus, the first of which supervises dispatches, secret questions, work of the President, and public audiences; the second—general correspondence, Legion of Honor, public ceremonies, and military police; the third—the personnel of the Central Military Administration and gratuities.

The General Staff of the army comprises the Cabinet of the Chief of the General Staff and two divisions between which the various services are divided as follows:—1st Division—in charge of the first assistant chief of the General Staff—comprises the bureaus of foreign armies, of military operations, of general instruction of the army, and of railways; 2d Division—in charge of the second assistant chief of the General Staff—comprises the sections of general organization and mobilization, of the personnel of the General Staff, of matériel and accountability, of military telegraph, of history, and of Africa. The following are the eight departments (directions): control, infantry, cavalry, artillery, engineers, administration, powder and saltpetre, sanitation. The interior service consists of three bureaus occupied with pensions, matériel of the Central Administration, and archives.

In the hands of the Minister of War are concentrated not only the organization and economy of the army, but also the supervision of the personnel and the instruction of troops. He supervises mobilization plans and strategic works; in fact, he directs the entire military establishment. To be equal to such a task is not easy, especially as the situation is complicated by two circumstances: the extreme *centralization* of the military administration,

in consequence of which a mass of details are accumulated there, and by the *frequent change of Ministers* (an average of one per year) who must expend much energy in becoming acquainted with the Ministry.* This circumstance serves to explain the predominant influence that the bureaus of the Ministry have obtained in France. These bureaus being filled with persons acquainted with the business of the Ministry by virtue of long experience can even impede the action of the Minister. The above characteristics are also found in our military administration. Both France and the United States however are to be congratulated on the permanency of the bureau officials. With every change of Ministry the nearest assistants of the Minister and the superior chiefs of the different branches are changed. Each Minister desires in the short period of his administration to effect certain reforms and improvements and therefore desires to have those persons who are in sympathy with him. The necessity of establishing greater permanency and consistency in the military administration is becoming more generally recognized and various suggestions have been proposed to that end: to appoint a minister from among the capable civil officials free from personal sympathy and not connected by feelings of comradeship with other persons; or to appoint as in England a special Commander-in-chief who would not be changed with the fall of the Ministry, or to enlarge the power of the Superior Military Council. These measures are very difficult to realize because the Minister of War is responsible for all the branches of the military administration and therefore his authority cannot be entailed. In latter time however two beneficial measures have been adopted: the Superior Council of War has been given such membership as to secure greater importance to its opinions and it has been recognized in principle that the Chief of the General Staff should not be changed with the change of Ministry.

SUPERIOR MILITARY COUNCIL.

This body, under the presidency of the Minister of War, consists of the Chief of the General Staff, and eight other members appointed by the President. These members are chosen from those generals who are going to occupy the highest posts in the

* Between 1871 and 1894 Ministers of War were changed 20 times. One of them occupied the post twice while another three times. Freycinet was Minister from 1888 to 1893. From the time of Louis XIV. (1662) to 1891 there have been 109 Ministers of War. The same conditions exist in Spain and Italy.

army in case of war including the future Commander-in-chief and the commanders of armies. In time of peace the latter receive a written appointment (*lettre de service*) in which is specified what armies they will command and of what troops they will be formed. They are compelled to prepare themselves for future operations, to study the theatre of their actions, they are required to inspect their corps, and to direct the general manœuvres in which the latter take part. The Minister is required to give over, for their discussion, all questions relating to the organization of the army, to the fundamental principles of instruction, mobilization and concentration, to the construction of important strategic roads and fortified points, and to the defense of the coast. By law the opinions of the Council are not obligatory upon the Ministry, but there is no doubt that they should strongly influence its decisions in the above important questions, a fact that prevents a change of views on these questions by each change of Minister of War. The Chief of the General Staff is subordinate to the Minister of War. In 1890 it was decided that in case of war he should become the Chief of Staff of the Commander-in-chief, a fact that considerably increases his authority and which strictly defines in time of peace the scope of his actions.

The selection of questions relating to the different branches of arms is effected by the above mentioned *directions*.

RUSSIA.

The Russian Central Military Administration dates from the time of Peter the Great. The Military Chancellery was in 1718 transformed into a war college (Collegium) where the superior administration of the armed forces of the empire was concentrated. This college organization of the Central Military Administration was preserved till 1812 when it was transformed during Napoleonic wars into the Ministry of War. At this time the Ministry received an organization corresponding to the large active army. At the head of the entire military administration was the Chief of the General Staff to whom the Ministry of War was directly subordinate. The Chief of the General Staff was the only person who reported on military matters to the Emperor. He directed all matters connected with the active service and instruction of the troops while the Minister had control of the economic administration. At the head of the artillery and engi-

neer corps were inspectors who were subordinate to the Chief of the General Staff in military matters and to the Minister in economic ones.

Shortly afterwards the grades of General Feldzeugmeister and Inspector General of Engineers, both of whom reported directly to the Emperor, were created. In consequence of this the administration of artillery and engineers was divided between three instances—the latter, the Chief of the General Staff, and the Minister of War. Later there was gradually developed, independently of the general military administration, two organs—the administration of military educational institutions and the Imperial General Staff for military colonies. The heads of these two organs reported directly to the Emperor. It is thus seen that instead of one person as in the beginning there were five who reported to the Emperor—a decided decentralization.

This was found inexpedient and in 1828 when Count Dibitch, Chief of the General Staff, was appointed Commander-in-chief of the army his former duties and those of the Minister of War were invested in Count Chernisheff. In 1832 the grade of Chief of the General Staff of the Emperor was abolished. In the same year the General Staff of the Emperor was transformed into a department of military colonies and included in the Ministry. By this transformation a considerable simplification was obtained in the military organization. All military and economic questions were concentrated in the Ministry of War and the former dual system was preserved only as regards the artillery and engineers. Military educational institutions remained as before outside of the domain of the Ministry. The necessity of a Military Council was soon recognized and this was placed under the presidency of the Minister of War. This status remained until 1860 when the administration of military educational institutions was incorporated in the Ministry of War and the administration of artillery was united under the Chief of Artillery who was responsible to the General Feldzeugmeister and to the Minister of War. The same took place in regard to the engineers, but in 1891 the grade of Inspector General of Engineers was abolished and his duties transferred to the Minister of War, the Chief of Engineers remaining. From this historical outline it is seen that the economic administration has always been invested in the Ministry of War, while the inspection and instruction of troops have been imposed on other functionaries who reported directly to the Emperor.

PRESENT ORGANIZATION OF THE MINISTRY OF WAR.

At the head of the Ministry of War is the Minister who is the superior chief of all branches of military administration. By law there is no direct authority stating whether the commanders of military districts (some of which contain several army corps) are directly subordinate to him or to the Emperor, still all representations of these chiefs which reach the Emperor must pass through the Minister of War who is the only person who reports directly to the Emperor on military questions. Besides this the Minister of War is the expounder of imperial orders and their executor. He inspects personally or through the assistance of his delegates, all troops, military administrations, and institutions. In economic matters he has no personal rights but acts in the capacity of the Military Council. The Ministry of War consists of: the Military Council, the Chief Military Court, eight chief administrations, the Chancellery of the Ministry of War, Imperial Headquarters and two Inspectorships, that of sharpshooters, and that of remounts and cavalry reserve brigades.

THE MILITARY COUNCIL.

The Military Council under the presidency of the Minister of War consists of members appointed by the Emperor. No governmental institution nor official can exercise any authority whatever over it or demand any account whatever from it. The authority of this Council is very extensive. In legal questions concerning the Military Department its decisions are presented for direct confirmation to the Emperor. Questions relating to other departments or those involving new expenditures are presented for decision to the Imperial Council whence they go to the Emperor for confirmation. In economic questions the Military Council is the decisive authority.

The Central Military Court consists of members designated by the Emperor. It acts as the highest military court of appeal, and besides, issues regulations concerning military court procedure.

The Great General Staff * exercises a wide influence. It is charged with : work of the General Staff such as—the solution of questions of strategy and organization, mobilization, and concentration of the army, transportation by rail, plans and maps, and

* See complete report upon the Russian General Staff in the Division Military Information by H. T. A.

information concerning foreign armies; with work of inspection such as—*completion* of troops and supervision of the personnel of active and reserve officers. It consists of three divisions: 1, the Asiatic, 2, the transportation of troops and baggage, 3, the military topographical; and two committees—the military educational and the mobilization. The other principal bureaus are the intendantcy, artillery, engineer, medical, military educational institutions, and Cossack troops.

UNITED STATES.

By Article II., Section 2 of the Constitution: "The President shall be Commander-in-chief of the Army and Navy of the United States, and of the Militia of the several States when called into the actual service of the United States."

The Constitution does not provide for the heads of the great departments of government but leaves this to Congress. In accordance therewith Congress created the War Department and "a principal officer therein to be called the Secretary of the Department of War." His duties shall be such as shall "from time to time be enjoined on or intrusted to him by the President of the United States agreeable to the Constitution." The Supreme Court has decided that he is "a civil officer and all his duties are civil duties." In a question purely administrative (Peters) the same Court decided that the Secretary of War was "the regular constitutional organ of the President for the administration of the military establishment of the nation" and that "rules and orders publicly promulgated through him must be received as the acts of the Executive, and such be binding upon all within the sphere of his legal and constitutional authority." Since the Secretary of War is a purely civil officer he cannot take the field nor do his duties extend to the military command of the army. The authority invested in the commanding general is delegated by the President by virtue of various acts of Congress. That the President has such authority is shown by the following act: "That the grade of General of the Army of the United States be and is hereby revived; and that the President is hereby authorized, whenever he shall deem it expedient, to appoint by and with the advice and consent of the Senate a General of the Army of the United States * * * who being commissioned as General may be authorized under the direction of the President to command the armies of the United States" (July 25, 1866).

General Scott said in 1830 that: "The Secretary of War has not either by the act creating his department, the rules and articles of war, or any other act of Congress, any direct command over the army. He can only issue orders in the name or by the express authority of the President. * * * Thus we have had, since the present organization of the army, (1821) four Secretaries of War, and at least as many *per interim;* whereas in the same period there have been but two commanders of the army, each, of course, professionally and minutely acquainted with the history, actual condition, and wants of the service committed to his immediate charge." In a word, the Secretary of War has control over the administrative service of the army while the General of the army is charged with the discipline and military control of the same.

A distinguished officer of the Adjutant-General's Department has said that "the Secretary of War should control the supply and pay departments, the administrative service of the Adjutant-General's and Medical Departments and Corps of Engineers, that portion of the Inspector General's Department not assigned to army, division, or, department headquarters, the Bureau of Military Justice, and the Signal Service."

"The General of the army, in time of peace, should command in all that relates to the discipline and military control of the military establishment, and in his capacity as chief of the 'Grand General Staff,' for the administrative service, watch over the economy of the service in all its branches. In time of war the General of the army, by delegation of the President, should have imposed upon him the duty of foreseeing, providing for, and ordering everything. His functions to be considered in reference to:

"The conduct of war.

"The movement of troops, and the disposal of all persons connected with the army.

"The superior administration, except as regards the expenses, with the right of requisition and contribution. The right to make all rules necessary to maintaining order and subordination."

General McClellan stated that he thought that the administrative control of the staff departments and corps should be in the Secretary of War, the military control in the General of the army.

The central administration of the United States consists of

the Secretary of War in charge of all administrative measures, the General of the army exercising military command by delegation of the President, the Adjutant-General's Corps, the Inspector-General's Corps, the Division of Military Information, the Supply Departments, the Chief of Engineers, and the Chief of Ordnance.

Each supply department has its accountant. Neither the cavalry, artillery, nor infantry is represented by any immediate head or special inspector in the central administration.

ADJUTANT-GENERAL.

The Adjutant-General is responsible to and makes yearly reports to both the Secretary of War and the Commanding General. All orders emanating from both these sources are promulgated through the Adjutant-General's office, which is unique in military systems. The relation in which the Adjutant-General* stands to the Commander-in-chief, to the Secretary of War, to the commanding general, is not clearly defined by statute. He has however, supervision of the entire personnel of the army, and is charged with the completion of all its branches.

GENERAL STAFF.

There is no analogous use in other countries to our misused word "Staff." In my opinion, the word should be used in connection with only those officers who do purely military duty of an executive nature or duties associated with the military administration of troops, such as adjutants, inspectors, chiefs of staff, collectors of military information, projectors of campaigns, aids, and so forth. To use the word with regard to duties of a civil or civico-military nature is misleading and at once makes it too general. Officers of supply, medical and pay bureaus, or of the engineer and ordnance corps are not staff officers. The former are respectively supply and medical officers and the latter officers of technical troops. Therefore our general staff as at present organized includes only the Adjutant-General's, the Inspector General's corps, and certain other officers occupied with the duties cited above.

The Division of Military Information is an embryo great general staff and should beyond doubt be subordinate to our chief of the General Staff, to him who is destined to use all collected

*A recent head of the Adjutant-General's department claimed that he was the Adjutant-General of the President.

and formulated information concerning our army as well as those of possible enemies, to him who must possess an intimate knowledge of all the military ramifications of the armed land forces of the United States in peace and war.

COMPARISON.

In examining the preceding, certain questions naturally arise:

(1) How far do the existing systems guarantee permanency and consistency in War Department methods?

(2) What position does the Minister of War occupy towards the army?

(3) What is the scope of the duties of the Chief of the General Staff?

(4) What is the status of artillery and engineer administrations?

In Germany, Austria, and Russia the difference in War Department methods is slight owing to the fact that the supreme power rests in the hands of the permanent head of the state who names the Minister of War, who cannot be removed by a change of political parties. In the United States and France each succeeding political party has its military representative in the cabinet. These changes in the United States do not usually occur oftener than once in four years, with the inauguration of a new President; while in France they occur with each political change of parliamentary majority in no way connected with the welfare of the army.

As regards the Minister of War, he is far more influential in France than in the other countries, because he is not only administrator, but de facto commander of the army. In Austro-Hungary he has likewise great power, but nevertheless acts under the direct guidance of his sovereign. In the United States, the Minister of War is in peace practically both administrator and head of the army, while in war the military head would be the commanding general under the direction of the President. In Russia the Minister of War directs all branches of military administration and is the only officer who reports directly to his sovereign. In this respect he occupies as it were the position of chief of staff of the Emperor. In Germany the functions of the Minister of War are considerably curtailed by having part of the General Staff and the supervision of the personnel of officers taken from under his control. In all these armies the expenditure of

funds destined for military purposes is under the general supervision of the Ministers of War.

The position of Chief of the General Staff in Germany is wholly independent; in Austria his position is also nearly independent. In France and in Russia he is subordinate to the Minister of War. In the United States the rôle of the Chief of the General Staff is shared by the Minister of War who has the division of military information and the Military Academy under his command; in a greater measure by the commanding general, who assists in drawing up plans for strategic movements and for mobilization and who is responsible for the dislocation of troops; in a lesser measure by the Adjutant-General who has charge of the recruiting of the army and of its entire personnel and therefore of all officers connected with the would-be general staff.

As regards the administration of artillery and engineers there exists a great disparity in the different countries. The supervision of the matériel is a question belonging to the Ministry of War, while the instruction and training is in certain cases imposed upon special organs. In the United States, France, and Austria, where all troops are subordinate to the Minister, there is no dual system; the chiefs* of these arms, where such exist, are like those of other bureaus and are entirely within the Ministry. In Russia the engineers fall directly within the domain of the Ministry, while the artillery has its special administration under the General Feldzeugmeister, who is the link uniting it to the Ministry. In Germany the inspector of field artillery is an independent chief, in no way subordinate to the Minister of War, while in the same country the link uniting the engineers to the Ministry is the chief engineer committee of which the general inspector of engineers is president and officers of the War Department members. The United States has no chief of artillery in the above sense.

* The United States.

IMPENDING CHANGES IN THE CHARACTER OF WAR.

By Captain JAMES CHESTER, 3d U. S. Artillery.

THE problems presented by the modern machinery of war have not yet been satisfactorily solved. Tacticians have come forward with solutions, some claiming to be rational deductions from recent battle experience, and some bald-faced assumptions based upon theoretical fire effects. Others again, unsatisfied with any solution yet offered, boldly declare that war will very soon become impossible if it is not so already.

To say that the tactical tinkers are all cranky enthusiasts, dealing with ideal soldiers on ideal battle-fields in an ideal way, would, perhaps, be to overstate the case. But experience teaches us to accept improved theories with caution. Ideal effects are seldom realized in action; and no factor of safety can be relied on to reduce theoretical to practical values in problems of war. An army of marksmen with magazine rifles in their hands, is, as yet, a comparatively unknown quantity on the battle-field, and fine shooting at long ranges under battle conditions, fire discipline, and the supply of ammunition are all in similar uncertainty. The arguments of the optimists on these points are not satisfactory. Perhaps long range fire by expert marksmen will be effective; perhaps it will be overwhelming. But the same thing was said of old-fashioned fire at short ranges, and *it* was often disappointing. There must have been a cause for that failure, and that cause, whatever it is, still operates, and is liable to produce similar results. Demoralization among troops is not always due to the fear of death. It often appears when there is no danger visible. It is a mystery, no doubt; but it is none the less a fact and therefore a factor in every problem of battle. Indeed it decides the day.

Mystery is not a mere feature of demoralization. It is always present on the battle-field even among undemoralized troops, exercising an influence in opposition to Reason. Reasonable certainty that they outnumber the enemy; that they have superior weapons and superior skill, will not always carry soldiers across the deadly zone. Reason as modified by the mystery cannot give them the heart to go. Indeed Reason has very little

to do with it in any event. If they cross the deadly zone at all they do it without thinking—without calculating chances. Councils of war never fight, whether held in the head of the soldier or the headquarters of the general. If the soldier goes, he goes in obedience to an impulse which he has no time to analyze. And frequently, when the danger is over, he is utterly amazed at his own temerity. And strange to say, the mental condition—the mystery—that makes him go, seems to depend on his leader more than on himself. What is impossible under Smith is often easy under Jones. And this is a manifestation of the mystery which tacticians persistently ignore. In battle men need leaders more than commanders. The higher grades, perhaps, need commanders most ; but the men in the ranks need leaders.

The art of leading, if it can be called an art, is a very much neglected one, and poorly appreciated. Jones comes to the front accidentally, and not because he is observed to possess the leader's mysterious power. Indeed the existence of such a power is persistently ignored. Science refuses to recognize it, and war is a science now, and almost exact. Kriegsspielers are the great commanders of the day, and the Kriegsspieler's art can be acquired. Leading is unlearnable, and therefore unscientific. The leader must be born to the business. His power is a patent of nobility, and he holds it from the Ruler of the Universe.

But these ideas are not popular,—they are not scientific ; perhaps not democratic enough for the day. They conflict with the modern idea that a man can learn anything—even to be a commander and leader of men—if he sets his heart upon it and studies the text-books diligently. Has not the art of war been written up, and thus put within the reach of any man ? Is not the Drill Book a compendium of the art ? It prescribes what to do, and how to do it under all conceivable circumstances ; and prohibits all other manœuvres. Surely it is the Alpha and Omega of the art. All necessary formulas for battle, offensive and defensive are there. Can anything else be needed ? We are obliged to answer, nothing, for such men as you. If ever you get command, you had better stick to the drill book and go through the motions of war. More could hardly be expected from you. Still there is such a thing as battle tactics ; but they are never prepared in advance. They are unwritten, and perhaps undreamt of till the moment arrives to put them into practice. But you will never understand them. Better stick to parade manœuvres and sham battles ; and the coun-

try, if it knew the facts, might devoutly pray that it may never have any other occasion for your services.

This, perhaps, might be called the era of shams. But of all the shams in existence, the sham battle is the most absurd. It lacks the only element which constitutes a battle, and is therefore a fraud and a teacher of falsehood. It gives young soldiers false ideas of a terrible reality; and when they first come under fire, the contrast between fact and fiction will be so appalling as to induce, or at least tend to induce, demoralization. Drill manœuvres are important and useful. They are intended to give the commander perfect control of his men but not to tie his hands in battle. Battle manœuvres are inspirations of the moment, born of, and exactly suited to, the situation, if the commander is capable; and strictly in accordance with the drill book if he is not. The colonel who commanded "On Right, by File into Line" under fire, acted exactly as prescribed in the drill-book; but he sacrificed his regiment all the same. The drill-book is dangerous in the hands of incapables.

But we do not propose to discuss the tactical problem. We consider such discussion unprofitable, and perhaps misleading. The ideal battle is altogether unlike the real, and the same may be said of tactics. And even should we confine ourselves strictly to historical examples we are very apt to err. Anything almost can be proved from military history. Then no two battle-fields are exactly alike; no two armies or armaments. The circumstances vary from hour to hour, even on the same field. No safe programme of battle can be deduced from history. Still a knowledge of history is essential to the commander. It helps him to analyze the situation; diagnose his adversary's purpose; and devise a scheme of action. History under identical conditions, generally repeats itself. The question is are the conditions identical? And that question can never be answered with the certainty that would justify planning a battle in advance. History says it has been done, but the instances are rare enough to be considered exceptions.

If an army is organized and trained so that it responds promptly in all its parts to the expressed will of the general, it is ready for the field. Cut and dried formulas for attack and defense need not be practiced in advance. Formulas only tie the hands of ability or cover the nakedness of incompetency. An army is always better without them.

But the idea that war is likely to become impossible because of the deadly nature of its machinery is too new and too startling to be passed over. Of course such an idea has not yet found a lodgment in any professional mind, so far as we know; but that proves nothing. "Have any of the rulers believed on him?" was contemptuously asked of the officers of the Jews, by the wise and learned Pharisees. And perhaps they had not. Yet "the common people believed on him," and as it turned out the common people were right. So the fact that no officer believes in the theory that war will soon become impossible, does not necessarily disprove it. Indeed we have heard professional whispers that frontal attack is already impracticable. We do not deem any apology necessary then, when we propose to look a little closer at the question, just to see what might be done if not only frontal attacks, but flank attacks and all other attacks were not only claimed to be, but proved to be impracticable.

Assuming therefore that it has been established by actual and oft repeated experiences of war, that all attacks are impracticable, would war become impossible in consequence? We think not. Indeed the difficulties, impracticabilities and impossibilities created by the modern machinery of war, are likely to lead to a shorter and easier solution of its problems.

The fact is, that the ordeal of battle between nations, by means of armies of chosen champions, as at present practiced, has about had its day. It is not a very ancient way of settling national disputes; but we have learned to look upon it as respectable, civilized and Christian. It takes some courage then to propose a return to more ancient methods. But the thing must be done. Conditions have changed and methods must change with them. The drift of events cannot be arrested, nor its direction changed by any laws of man's manufacture, even if it threatens to undermine what we call civilization and religion.

Looking at the problem reduced to its lowest terms, we see that when a man fights for his life he hits his adversary where it will hurt most. And he is justified in doing so. When a nation is similarly situated why should other rules prevail?

In ancient times, and in times that are not so very ancient, wars were chiefly due to the ambition of kings or their lust for conquest. The people had little interest in them. The quarrel was none of their making. If they fought or contributed of their substance, for the prosecution of the war, they did so, construct-

ively at least, under compulsion. Their claim therefore that their goods and chattels should be exempt from seizure by an invader rested on a solid foundation. They were non-combatants in fact, and their claim was very generally recognized by civilized armies. But conditions have changed. Demos is king in many nations, and War and Peace are under his control. Under democratic rule, not only as it exists in republics, but in all constitutional monarchies, every voter is a part of the sovereignty and therefore responsible for the official acts of the whole. He is constructively a combatant of the most dangerous kind. He it was who started the war, or helped to do it, and he supports it with his substance if not with arms in his hand. He can at least help to put a stop to it when he pleases; and the shortest way to convince him that the time has come for such procedure is to give him a taste of war's realities. He is an adversary of the most persistent kind. His will; his influence; his money, goods and chattels; his pride and patriotism if you please, are all in arms against the invader. They are the fuel that keeps the fire a burning. In the name of God then, lay hold of them; destroy them; do anything to them in the interests of Peace—anything that will help to change the mind of that stubborn enemy, their owner.

And there ought to be no inhumanity about it. We would not advocate a revival of the "Fire and Sword" treatment any more than we would capital punishment for petty larceny. But it does not follow that we would let a hostile belligerent or a thief go free. The wealth of a nation, its powers of production, and means of distribution, whether owned by the government or private parties, ought to be legitimate objects of attack by an enemy in war. And they will be of necessity, when all other attacks become impracticable, the shortest and surest way of paralyzing the nation and so inducing peace.

That there would be less barbarity in such methods than in those at present practised is not likely to be believed by the majority of men. They have got used to the established method—the ordeal of battle, in which the nation is represented by champions, chartered or conscribed, and cast into the lists to fight according to recognized rules. Of course a wealthy citizen can afford to be stubborn under such a system. As long as his person and property are unmolested, and champions can be purchased, the game will go on. Any change in the system would be unpleasant. But the Eternal Laws of Right and Wrong are always un-

pleasant to the transgressor. Physic is proverbially unpleasant to take. But sometimes it has to be taken. In this case the disease has become desperate. The old remedies—frontal and other attacks—are impracticable, and the question is not what would the patient like to take, but what should he take? When that question is satisfactorily answered the dose must be administered whether the patient likes it or not.

These views, which we do not expect to be applauded, are our answer to the optimists who believe that war will soon become impossible. We believe on the contrary, that the modern machinery of war will compel belligerents to cast off their conventional trammels, and conduct their campaigns in the way most likely to produce peace in the shortest possible time. When Greek meets Greek and each finds the other invulnerable what is to be done? Abandon the fight or attack the adversary's resources? Attack his resources by all means and so starve him into surrender.

Is there any likelihood that war will be abandoned with such a fruitful field of operations open to it? We think not. But it will change its character somewhat. Every citizen will have to be a soldier, every city a fortress, every house a castle. The army will be everywhere, and will include everybody, if it is on the defensive. An aggressive army will be a mounted force. It will consist of cavalry, horse artillery, bicyclers, engineers and dynamiters. It will be an invader. Its field of operations will be the enemy's country. It will have to get in there somehow, and go anywhere. It will have no objective point, no lines of communication, no base of supplies. It will be an army of raiders in the broadest sense of the term. It will avoid fighting; travel light; live on the country, and carry devastation wherever it goes. Railroads, telegraphs, factories, stores and store houses, shops, barns, roads and bridges—all existing wealth and the means of further production and distribution will disappear before it; and gaunt famine and pestilence will follow in its wake. And that will be war as developed by modern machinery. Terrible! say you? Well, yes. War ought to be terrible. The trouble is that it has ceased to be terrible to altogether too many men. Only those who are cast into the cock-pit know half its horrors. Others rather enjoy the excitement of it. It is not uncommon to hear men, good, peaceable citizens, wishing for war as if it were a national pastime. And no doubt it is a kind of

pastime to the spectators, and enjoyable enough when trade is lively, and money abundant, and government contracts not impossible, and the poor devils in the cock-pit cutting each others' throats as an accompaniment. A thrilling drama, and possibly profitable. No wonder the non-combatants wish for war.

But the signs of the times indicate that all this will be over soon, and the "Scourge of God" will be laid indiscriminately on the backs of every member of the erring community, whether he be in the cock-pit as a combatant or not. Unjust? Not a bit of it. The fact that they are punished is proof that they deserve it. The Eternal Laws of Right and Wrong enforce themselves. Men may enact iniquity and call it law, but it remains iniquity all the same, and in due time will be scourged out of existence. That a majority voted for it and thought it was right is no excuse, and no mitigation of the transgression. The Eternal Laws have been broken and the correcting scourge must be applied.

Whoever undertakes to make laws for a nation assumes a terrible responsibility. Men, it must be remembered, cannot make laws. The Laws were all made with the Universe. Right and Wrong were ordained from the beginning. They are eternal and unchangeable. Men may discern them, clothe them in words, and enact them for the government of the people. Again they may not discern them, but may enact Iniquity and call it Law. In the first case they are a favored nation. In the second they are condemned and doomed to the scourge. And the scourge will be applied whether civilization and religion, so called, like it or not. If there is no neighbor sufficiently powerful to apply it, the culprits will apply it to each other. God has decreed it. It is as certain as gravitation and equally impossible to escape.

It is painful to listen to the thoughtless men of a nation prating of power, and appealing to numbers and wealth and national valor as guarantees of safety, when that mysterious something in their midst may in a moment change their hearts so that "Brother shall deliver up brother to death, and the father his child." Nations are never safe, no matter how remote from powerful neighbors they may be. If they deserve the scourge it will be applied unsparingly, even if a brother has to act as executioner.

The strength of a nation is not to be measured by the number of its battalions and the excellence of its armament; but by the wisdom of its laws and the righteousness of its government.

INFANTRY ATTACK FORMATIONS.

By Captain JAMES A. LEYDEN, 4th U. S. Infantry.

THE present state of tactical development in Europe may be briefly summarized as follows:

Germany.—No changes have been made in the drill regulations, the conviction that battle tactics are none other than fire tactics has been steadily gaining ground, and, with this in view, changes have been made in the firing regulations.* It must be remembered that the German drill regulations contain no normal formations, a general example of an attack formation is given but it is in no sense a normal formation; normal battle-fields and normal conditions rarely, if ever, exist, so it is left to each officer to determine the suitable and appropriate formation applicable to the special case that may confront him. The officer well knowing that he is required to do the sensible and intelligent thing under the circumstances, if he does not he will be compelled to leave the service.† At the same time the officer knows that to neglect or delay acting upon his own responsibility will be a heavier aspersion upon his character as a soldier than to make a mistake in the method of acting.‡ Bearing this in mind, it is interesting, as showing the drift of tactical methods, to note that in Alsace, in the autumn manœuvres of 1893, deployment as skirmishers was not made in attacking. Platoons in single rank advanced in line, under command of lieutenants. At no time were the men on the firing line more than two feet apart and generally they were touching. Vacant spaces in the line were between sections or platoons.§ The reason for these changes is of course in the direction of better command and control of the firing line. It is moreover in keeping with the decided reaction against too great tactical freedom on the part of inferior leaders mentioned in Loebell's reports for 1894. More recently, September, 1894, in the manœuvres near Konigsberg, East Prussia, the company support and reserves were not used, their places being

* Autumn manœuvres of 1894. Mil. Inf. Div. A. G. O. No. 6, p. 74.

† *Ibid.*

‡ Maude, Essays and Letters, p. 271.

§ Organization and Tactics, p. 469, and Loebell's Reports.

taken by a single firing line. The attack was supported and pushed home by companies following in rear of those first sent into action.*

France.—The hostility against the company support and reserve system has been very bitter. A system of *petits paquets* it was called, in which the supports and reserves represented a capital bearing no interest, bullet stops for shots that miss the firing line, etc. In their recent regulations, adopted in April, 1894, these features practically disappear. Particular stress is laid in the new regulations upon the duties of scouts. These men are to be carefully selected, at the rate of two from each squad, carefully trained and favored whenever practicable. In the company papers they are specially borne as scouts. In proceeding to the attack, taking the case of a battalion in regiment, the firing line of two companies is preceded by the line of scouts at a distance of 500 metres. The firing line advances through the zone of artillery fire in line of columns of platoons or sections, at deploying intervals or at greater intervals should the front assigned require them. Arriving at about 1300 metres from the hostile position the companies are deployed into line in single rank, or double rank with one pace interval between files; in this formation the advance is made to the line of scouts, ordinarily about 900 metres from the enemy, the scouts, having been compelled by the enemy's fire to halt about that point. Single rank is invariably taken when the scouts are reached. When thus deployed there is an interval of about 30 paces between companies. This interval is maintained as long as possible. The reserve companies follow the firing line in such formation as will best enable them to obtain shelter and concealment. When fire is opened it is generally by volley, that by section being preferred. File firing is not opened until 250 metres is reached. [In the manœuvres of 1893, prior to the adoption of the regulations, rapid fire with fixed bayonets was opened at about 400 metres. However desirable it may be it is extremely doubtful if the requirement limiting file firing to within 250 metres can be enforced.] In the advance the company moves in one body, guide centre, the fire action alternating with the advances. The reserve companies gradually draw near the firing line, behind the flanks or opposite the intervals. When supports are ordered platoons are generally thrown in; after joining the firing line they belong to the nearest

* Autumn Manœuvres 1894. A. G. O. No. 6, p 58.

company and advance with it. The battalion of the second line approaches gradually and if necessary it furnishes reinforcement for the fighting line. From 400 metres to 250 metres the advance has been by rushes, each followed by rapid fire action of short duration. At a signal from the colonel the assault is made.

These changes in the German practice and the French method mean, in short, that the skirmish line of deployed squads is replaced by a line in single rank, with intervals between companies, platoons or sections; that the entire formation is reduced in depth and that the squad support and reserve features have disappeared.

There is no doubt the French and Germans are to-day leaders in tactical methods and that the described forms represent the highest developments in this direction. It is therefore with no small measure of surprise that the student turns back to our Civil War, and finds an attack formation, which almost approximated to a normal, was "A line of scouts varying in density according to the nature of the ground; two to three hundred yards in rear the first line in double rank, then in rear a second line and a reserve. The first line deployed as skirmishers which went forward as far as its momentum would carry it, then a fire fight ensued, until the second line came up in the best order possible and carried the first along."* Surely from the "contest of armed mobs" valuable tactical lessons might have been learned.

The reasons underlying these changes, if we can judge from contemporary foreign literature, are better command and control of the firing line and increased development of fire at the beginning of the attack. Service with the colors having been reduced to two years, it has been found impossible to train and discipline the recruit to that iron discipline upon which the system of squads in extended order is essentially based. Notwithstanding the "nation in arms" atmosphere or the spirit of *revanche* which together animate military matters in these countries, two years' constant training is not enough to fit the soldier for the requirements of the system. Concerning the fire development it is difficult to see wherein a distinct advance has been made in the new regulations. The maximum development of fire should be reached at the decisive range. With companies at full strength advancing to the attack, casualties will soon reduce and continue to reduce the fire power. The casualties must be replaced, and

* Extract in Capt. Fornance's paper on Extended Order, JOURNAL 781.

considerable fractions of the companies in rear are thrown into the firing line. Confusion resulting in more or less loss of control must follow unavoidably.

England.—The regulations adopted in 1893 are said by European critics to mark a great advance over their old system. The new system retains much of the old linear and parade features, and, more than any other of the later regulations, favors the defensive. The reason for this is of course found in the fact that in England's continual detachment war against savages or undisciplined numbers, a greater measure of cohesion and resisting power is necessary than would be against civilized nations. England's present tactical forms are adapted to the kind of warfare she is generally carrying on; some of her ablest writers, however, do not hesitate to say that the new regulations are unsuited for war against trained and disciplined troops.

Coming now to our own country: It has already been indicated that the extended order feature of our Drill Regulations is the counterpart of the abandoned French system. Our regulations are being revised by General Ruger. The fact revision is necessary so soon after adoption is proof sufficient that they are wanting in some important particulars. I believe I express the opinion of a very considerable number of infantry officers in saying that our present regulations are poorly adapted to our organization, the probable character of our battle fields, and the discipline of the troops we will have to lead in war. In saying this I am aware that nothing is easier, and, after the adoption of a new system, nothing unfortunately is more common than comparison, criticism and fault-finding against newly adopted forms. So long as such criticism is honest and competent and the critic can offer something to replace that which he assails perhaps no great harm is done, but indiscriminate fault-finding and criticism against established forms is pernicious in every sense of the word.

The main reliance of our country in the event of war will be, as it has been in the past, upon volunteer troops, and any system of tactics we may adopt should be such as to be readily acquired by volunteer officers and soldiers. Unquestionably these volunteers possess individuality, enterprise, and fighting qualities of very high order—none superior perhaps—but they do not lend themselves kindly to that discipline which we as military men know to be the foundation of extended order tactics. Our armies

at the close of the Civil War were as powerful as were ever organized, but it required three years of war service to reach a state of discipline which made the other qualities of the volunteer so valuable.

Considering the general form of our battle tactics, whether they should be offensive or defensive in essential features, but little need be said; our northern and southern frontiers indicate two possible theatres of war in which considerable forces may be employed. Against southern enemies the experience and lessons of 1846-47 indicate that a vigorous and unceasing offensive alone is appropriate. Against our northern frontier political and strategical reasons would seem to require invasion. In both cases an offensive campaign of necessity means offensive tactics. The defensive, and by this I mean of course the defensive offensive, may be forced upon a commander at any time, but the defensive purely never has and never will defeat or reduce an enemy. It would seem therefore that whatever system we may adopt should be distinctly offensive in its general features.

Concerning the details,—and this of course is the entire tactical problem,—we have seen that the squad system of extended order requires the highest attainable training and discipline. That in this system squads, sections, platoons, companies and battalions become indescribably mixed in the preparation for and the assault proper; that command, fire control, and the transmission of orders, in the most important stage of the battle is next to impossible; and finally, however disagreeable it may be to say, the fact must still be recognized, that in every body of men a certain number require but small excuse or opportunity to fall out and go to the rear when hostile bullets are whistling. Skulkers there have always been in every great battle and doubtless the future will resemble the past in this particular. The squad system with its divided responsibilities offers greater opportunity for skulking than does the old closed formation.

The question of vulnerability of the formation, within the zone of effective infantry fire, is capable of mathematical analysis and determination. It can be proven that every foot of depth increases the vulnerability of a formation; that the line is less vulnerable than the column, and the line with intervals less than the closed line. But vulnerability of formation is of secondary importance; the power of inflicting injury upon an enemy comes first. The maximum fire action depends upon the number of

rifles that are brought to bear. Long range fire being, for the same number of rifles, less effective than short or mid range, it follows that the number of rifles should increase as the enemy's position is approached. Two men per yard of front is about the number that can effectively use their weapons. If then, for the purpose of argument, we disregard the casualties produced by the enemy's fire, a line in single rank proceeding to the attack should be reinforced at or near the decisive range by a similar line; together they will deliver the maximum fire against the enemy at the point where fire is most effective. Casualties must necessarily be considered, no line can advance through this zone of death without suffering great loss; to replace these losses is the tactical problem.

Without going further into the conditions I desire to outline briefly a system which I think applicable and appropriate. It needs no argument to establish that line formation is best for command of the men and control of their fire. To make the line less vulnerable it should be extended as much as practicable consistent with that command and control. An interval between men of one yard is as great an extension as will fulfil these requirements. A platoon of 32 men in single rank thus extended will cover a front of about 50 yards, certainly as great a length of line as a single officer can directly command in action. The battalion being the tactical unit the attack formation should be primarily suited to its organization. Assuming then that battalions are of four companies and that regiments contain three battalions each. The companies should, as is now authorized by law, contain over one hundred rank and file, say three platoons of thirty-two men each as a minimum. The platoons, in battle formation, are commanded, from right to left, by the 1st lieutenant, the 2d lieutenant, and the 1st sergeant.

The frontal attack being one in which the greatest number of men are required, we assume that an attack of this nature on troops in position is to be made by a regiment of three battalions. The major of one of the battalions having received orders from his colonel to form for attack on a designated position, designates two companies to form the firing line. The companies designated at once send out their scouts, at least two non-commissioned officers accompanying and commanding them. The scouts cover the designated front and advance about 500 yards before the companies begin their advance in column of fours or twos upon

the designated objective. The companies advance through the zone of artillery fire with an interval of at least thirty yards more than deploying space.

The scouts will be able to reach a point within 900 yards from the enemy before they are stopped by his fire. The companies, when infantry fire begins to be effective, between 1200 and 1300 yards, form line. The captain then designating the second or centre platoon as the firing line of the company. The platoon detaches itself from the company and at once deploys as skirmishers with one yard interval between files. Advancing with guide centre the platoon joins the line of scouts and carries it forward, the fire action being at this stage by volley and with as much deliberation as possible. The firing line now being stronger should be able to reach a point between six and seven hundred yards before its fighting momentum is exhausted. Meanwhile the first platoon has been extended and is coming up directly in rear; as it approaches an increased gait for about fifty yards is taken; joining the firing line is carried onwards; the 1st lieutenant is now in command of the combined platoons; he carefully controls the fire and alternates his fire action with rushes of about 40 yards to the front, being careful not to make his rush while the firing line of the adjoining company is in motion. The casualties now become frequent and the line is unable to reach a point nearer than 550 yards. The third platoon extended as were the others, now joins with the captain. The rush it has been compelled to make on joining has been longer than that of the others, but the line moves under the impulse. It should be able to reach 450 or nearer before casualties compel it to stop. The major, following the advance, has already directed the remaining companies to reinforce the firing line by platoons thrown in at short intervals. The leading platoon of the second company joins and the line moves close to 400 yards, then the next platoon, after brief fire action of the line, joins, the third platoon of the second company joins as did the others and the line reaches the point of rapid fire with fixed bayonets. This fire can last but few minutes, the assault must follow. The second battalion has been advancing in two lines of two companies each, company front. The lines not more than 150 yards apart. As the line approaches the firing line the colonel signals the assault. Prior to this, however, all the musicians of the second and third battalion have been united, and as the first line of the second bat-

talion nears the firing line they are required to play. The assault is given by what remains of the 1st battalion and the two companies of the second battalion. The other two companies, up to this time moving in line, now change to column formation and move directly toward the point of assault. The object of this change under fire being to secure the arrival of a compact body capable of penetrating the disorganized mass and secure the position. The third battalion has meanwhile been moved to one or the other flank and disposed by the colonel to meet the counter stroke if any should occur.

Should the action have been very severe the second battalion must be used to reinforce the firing line as was the first battalion. Should the entire second battalion be thus used we will have had no less than twelve platoons reinforcing a fighting line of fifty yards front at the start. General Skobeleff, than whom there was no better judge on this subject, says at least nine lines are necessary. History shows that in general engagements at least ten men per yard of front are required for successful assault. This of course includes reserves, flanking detachments, etc. In the formation described we have put four men per yard of front, including intervals, into the firing line.

It will be noticed that in this proposed formation, the regiment has fought on a battalion front; that the battalion has fought on a front actually but little greater than two companies. Between the companies on the firing line there has been an interval of about 30 yards, which as the line was reinforced would naturally become smaller and would probably disappear as the assault is given. It will also be seen that there has been no squad or section division; each officer commands his proper subdivision; there is no support properly speaking; when reinforcement takes place it is by entire platoons under its own officers. When the fighting momentum of the company is overcome what is left of it is together under its officers if any of them be left. The next reinforcement is from a company in the same wing of the battalion, the officers and men of which are known to each other. Should further reinforcement take place it is from another battalion but from the same regiment; and so on to the final issue of the battle. Some degree of confusion is unavoidable but in what is proposed this mixing of commands is reduced to its lowest limits.

Concerning fire control: With commissioned officers giving

commands to men they habitually lead it is reasonable to expect better control than if the commands are repeated through several subordinate leaders; the amount and kind of fire can also be better regulated. The fighting front of the company is but little greater than that of double rank closed formation; the influence of the officers and of the non-commissioned officers who assist, is, in this formation most intimate; if fire control is possible at all it should be under such circumstances. The reason for doing away with the squad support and reserve system I believe I have already indicated; in that system the highest degree of training and discipline are essential. These we will not have in the volunteer troops that will compose the fighting strength of the country in the next war; at least not until a year or two of war training has been experienced. Under the new conditions wars are not likely to last so long and if they should it would be unadvisable to change tactical methods during the struggle. Therefore I repeat, we should have a tactical system adapted to our volunteer forces, simple in detail, one that will give scope to the individuality, intelligence and fighting qualities of that class of soldiers, but which will minimize the defects due to want of training and discipline.

In conclusion, it is proper to remember that whatever the War Department may adopt for our service, it remains our duty to be familiar with foreign methods and systems; from them something may be gathered that will find application in the ever varying conditions of war. Recent regulations in all services are against stereotyped forms and rules. Officers are now given greater freedom of action but are held to a more rigid responsibility for their acts.

"The relatively short duration of the world's great wars since our Civil War demonstrates that warfare is becoming an art dependent on the exact sciences quite as much as on personal bravery. We shall never want men and money in an emergency, but the ability to use them effectively can only come through the study of the officers of the staff and line of the army." *

* Report of Secretary Lamont, p. 24, 1893.

DISCIPLINE IN THE NATIONAL GUARD.

By Lieut. C. H. HITCHCOCK, N. G., N. Y.

THE subject of discipline has been discussed at considerable length in this JOURNAL during the past year, and the ideas advanced have been full of interest. The subject has been treated, however, almost entirely in its relation to regular forces; and the special methods and means of attaining discipline in the State service, made necessary by the materially different conditions, have hardly been touched upon. The enlisted man in the Regular Army is all the time subject to military law and regulations. The National Guardsman, on the other hand, comes into a military atmosphere but one night a week, with possibly a week's duty in camp during the year. The one is paid regularly for his services; with the other the service is purely voluntary, and is usually rendered at no little sacrifice of both time and money. Any effort to secure discipline in the National Guard by means identical with those employed in the Regular Army, ignoring these special conditions, will fail of the best results.

The writer has had an experience of nearly fifteen years in the National Guard, and has seen its development from a state where discipline was practically unknown, to its present condition, which, as regards training and discipline, is at least a long step in advance. The following suggestions are made, as the result of experience and observation, regarding the best means of attaining discipline under the conditions which exist in the National Guard.

The first and prime requisite is that the officers should be the manifest superiors of those whom they are to command. An officer should never allow a subordinate to surpass him in military knowledge, skill or hardihood. He should be prompt and accurate in the performance of duty himself; and he may then fairly require the same of those under him. Strict and impartial justice, an even temper, with the necessary firmness, are indispensable. Kindness and courtesy must be employed, but this does not imply familiarity. Severity in reproof can be indulged

in, but sarcasm never, as this leaves a sting which is seldom recovered from. It should be apparent to the enlisted men that the welfare of the organization and its members is the controlling consideration. Military qualities and attainments are generally found in the officers in the Regular Service as the result of special education and training. Officers of the National Guard, in the absence of this special education, should endeavor to perfect themselves in every way, and neglect no opportunity of acquiring professional knowledge. The time has gone by when a mere knowledge of the rudiments of the drill book were sufficient. The more general knowledge of the art of war and military science an officer acquires, the more readily, *ceteris paribus*, will he command the respect and obedience of the men under him. Slack discipline in any service is usually in the last analysis the fault of its officers.

Drill is no doubt the best means of inculcating and fixing the habit of prompt and accurate obedience. For this reason drills should be frequent and carefully conducted. Sufficient variety should be infused into them to keep interest and attention from flagging. All movements should be explained and errors pointed out. The "setting up" exercises and the bayonet drill afford admirable exercise, and if judiciously employed will serve to vary the drill, and will have a visible effect upon the physique of the men.

Military courtesy, "indispensable to discipline," cannot be too strongly insisted upon. No other cause has contributed so much toward the progress of the National Guard in discipline as the now very general observance of the salutes as prescribed in the regulations.

Zeal and fidelity should be rewarded. To this end it is most desirable that non-commissioned officers should be appointed rather than elected. In any case they should pass the impartial scrutiny of an examining board. A limited number of badges for faithful service, regular attendance and proficiency in drill and rifle practice may be awarded with advantage. These badges should be neither numerous nor easily won. The distinction conferred should not be cheapened in any way, or its value is lost.

It follows that neglect and inattention should be punished. Punishment, however, need not be severe or frequent, and never such as to arouse any sympathy for the offender. In most cases it is sufficient to demonstrate the power and the disposition to

inflict a penalty in a few marked instances. These considerations, of course, do not apply to those rare cases of insubordination where authority is defied. These should be promptly met with a degree of severity that will fully vindicate discipline.

In cases where irregular attendance, careless demeanor and habitual inattention to duty indicate that a man's usefulness is at an end, he should be discharged for the good of the service. If after the ordinary measures and proper warning there is a failure to reform, it is of little use to try to compel. By discharging the man a constant source of trouble and annoyance is gotten rid of, and a bad example removed from others.

Promotion should be lineal so far as possible with due regard to fitness. This principle, if once established, will do away with an incredible amount of jealousy and ill-feeling, and thus remove many causes of complaint and disaffection. Every non-commissioned officer must be held to an accurate performance of duty, or his place filled by a better man.

Junketing excursions and voluntary encampments are to be avoided as demoralizing in a high degree. When a man pays his own way he may with good show of reason claim the privilege of having a good time in his own fashion,—a condition incompatible with discipline. On occasions when the organization is under orders and receives pay a strict obedience can justly be demanded, and is usually enforced without difficulty.

Civil organizations are a sort of anomaly in a military body; and, if they exist, should be confined to narrow limits. The captain should be in all things the head of his company. He with his lieutenants can usually decide matters as satisfactorily as a full company meeting. A civil organization should be confined to the collection and expenditure of civil dues, and to the management of the social functions of the organization. It should never be allowed to usurp any of the powers of the commanding officer, or dictate to him. The captain should have complete veto power.

Anything that adds to the attractiveness of the armory in the way of occasional social dances, reading and card-rooms, gymnastic apparatus and a rifle gallery are valuable aids toward the discipline and efficiency of an organization. Such attractions make recruiting easy, and enable the captain to pick and choose among candidates for enlistment, and hold men to a better performance of duty. It must be understood, however, that these attractions

are secondary and accessory to the end of obtaining a strong and reliable military organization. It must never be allowed to degenerate into a social or athletic club.

The respect and good-will of the men should be gained and held. They should get the idea that it is a privilege and an honor to serve; and that this privilege may be forfeited by neglect, inattention and bad conduct. *Esprit de corps* is a powerful lever if rightly cultivated and applied. If pride in the service and in the organization can be instilled, the task of the commanding officer is an easy one. Proper care in the selection of recruits is necessary. I believe the common experience is that young men from twenty to thirty years old from the class of skilled mechanics in our cities make the best material for soldiers. Young men of good character, taken from this class, if treated on the lines indicated will make a company or regiment of exceptional intelligence and physique, and will attain a state of discipline sufficient to make them reliable for any duty that can fairly be demanded of National Guardsmen.

PRACTICE MARCHES OF LIGHT ARTILLERY.

By First Lieut. E. M. BLAKE, 4th U. S. Artillery.

IN writing on the subject of practice marches of Light Artillery, I wish to state before beginning, that I have been able to find very little information on this subject, in the books of reference within my reach, hence I have had to draw almost entirely from my own limited experience.

The objects of such a march may be summed up in the one word "experience" which may be considered as applicable to officers, men and horses, and in another sense to the matériel.

OFFICERS.

The experience to the officers is of various kinds such as, obtaining military information of the country passed through, selection of sites for camping, and of watering places for horses, finding out practically how much work to expect from horses under various conditions. (In proportion as the country passed through is rough and unsettled, this experience will be the more valuable.) Manœuvring over unknown ground, and target practice (which should always take place) on ranges with which they are unfamiliar.

Going more into detail on these subjects, all will admit the value of the information as to the topography from a military point of view, of the country passed through by actual marching over the ground. The ordinary county maps, which are probably the best available information, leave much to be desired, as they contain so little that is of value from a military standpoint, and they are usually very inaccurate about everything bu main roads and large streams. There may be exceptions to this in the more densely settled parts of the country. The Coast and Geological Survey maps published by the Government are excellent, but unfortunately they cover a small area.

Selecting sites for camping is not as a rule difficult, the most important particular to be observed is a suitable space for the picket line, if this can be obtained, and water for the horses is within reasonable distance, the camp can be used no matter what may be its other disadvantages. If the camp is to be occupied for any length of time more care with regard to details is necessary in its selection and the suggestions in Drill Regulations should be followed as closely as circumstances will allow. In a march every officer should be required to ride ahead and select a camp several times.

As regards the amount of work a horse is capable of, if the country is comparatively level and the roads in good condition a battery may go from 25 to 30 miles a day and the horses come into camp at the end, in good condition. If the roads, however, are such as one finds in the United States, except in the more thickly settled sections, 20 miles may be considered as a large limit. In my two experiences the average distances were in California about 16, in New England about 19, the former of these was in the portion of the coast range known as the Santa Cruz Mountains, extending along the coast from San Francisco 90 miles south to Santa Cruz, then back across the range into the Santa Clara valley. All the marching in the mountains was over ordinary country roads, the 30 miles in the valley was over a macadamized turnpike.

The latter was across Massachusetts from the Berkshire Hills to Worcester, and the whole length of Rhode Island from north to south. Part of this was over country roads and part over macadamized turnpikes. In both cases mountains were crossed from 800 to 1000 feet above the surrounding country.

In the latter march only did we have drills and target practice.

The drills were not very satisfactory as the ground was too limited, but in moving in and out of camp, and in target practice we had frequent opportunities to test the manœuvring possibilities of guns and caissons.

ENLISTED MEN.

What I have said of experience to the officers will also apply to enlisted men, and especially to the more intelligent among them, who would be likely to become officers of volunteers in time of war. There are other things that they also learn on the march, and that can be learned only by such an experience. I refer to getting the best work out of the horses with the smallest waste of strength, the methods of overcoming obstacles, crossing bad bridges, helping carriages and teams that get into trouble, watering, feeding, and caring for their horses when under other circumstances than those of the garrison.

As regards the men personally, they learn how to take care of themselves when "roughing it"; a trip of this kind makes them appreciate the comforts of barracks, and realize that the life of a soldier is made up of something else besides garrison duty. The most important lesson to the soldier, as it is to the officer, is the manœuvring of his gun at drill and target practice on unfamiliar ground, as it shows just how much reliance he may place in the gun when called on to use it against the enemy. Judging from what I saw at our recent target practice, I think the men would have great confidence in the accuracy and power of our field-gun should the occasion for its use arise. A more liberal allowance of ammunition, and more frequent practice than once a year, would be very beneficial in stimulating this confidence and in making them take greater interest in their profession.

MATÉRIEL.

The experience to matériel might more appropriately be summed up in the word test, and as with the men and horses, the more variable the country passed through, the more valuable the experience, so also I believe the same applies to the guns, caissons, and supply wagons.

The test may be subdivided into three heads for consideration:—1st. That on the roads in the actual march; 2d, That when manœuvring over unfamiliar ground for purposes of drill or target practice; 3d, That when actually firing with service ammunition, simulating as nearly as possible the conditions of the

battle-field. Of these, all of which are important, the 3d is most so. The first applies to all vehicles alike, the second to guns and caissons, and the third to the gun-carriages only.

Taking these more in detail, if roads are hard and well macadamized and tolerably level a battery can generally march along at a good walk and the supply wagons keep well closed up to the rear of the column. As soon as rough roads or mountainous country are entered the tendency of the column to lengthen and straggle will appear, the guns and caissons leaving the supply train behind.

Limber and caisson chests should always be full of ammunition, and everything that the carriages are expected to carry in time of war should be on them so that the load may be the maximum. The team and carriage will then do the maximum work that can ever be required of them, and develop weaknesses and defects at a time when they can be remedied.

On the march I made in California the train consisted of five army escort wagons, drawn by teams of four mules each. On the march in New England the train consisted of a wagon manufactured by the Ordnance Department, and a heavy spring wagon with high body and low wheels, such as is used for heavy trucking in cities, these two being drawn by spare battery horses. The difference in results was greatly in favor of the army mule and escort wagon. In the first case there was not a single delay caused by the train, which was always well closed up in rear of the column, so that on arrival in camp no time was lost waiting for the mess kits. In the latter case there were frequent delays, and on steep hills teams from guns or caissons had to be sent to the rear to help the spare horses bring up their extra heavy load, besides which, to keep from using them up, the spare horses had to be frequently replaced by teams from guns or caissons.

The ordnance wagon was more satisfactory, but it does not pull as easily as the escort wagon for the same load.

What I have seen of the second and third heads of the subject will be described under target practice at the close of this paper.

PREPARATION.

There should be no preparation for such marches other than that which the regular garrison routine affords, or in other words, the battery should be prepared to take the field all the time. The best method of testing efficiency would be to have the bat-

tery commander without previous warning receive orders allowing him a limited time in which to make preparations, and arrive at, and be established in camp at some mentioned place several days march from the garrison. Then have the battery thoroughly inspected by a competent artillery officer who has had enough light battery service to know how to make such an inspection.

Some of the superfluous staff officers mentioned in the last Annual Report of the Secretary of War might well be employed in going over the route to be followed, obtaining supplies, information, etc., and in general performing practically the duties defined as pertaining to them, in the various works on the Art of War. Under our present system, a practice march usually originates with the battery commander, and is preceded by a begging correspondence between him and the powers that be to obtain permission to make it. I shall not attempt to enumerate the obstacles he must overcome before finally cutting loose from the post, as we are all too familiar with them. During this correspondence, the horses are what is technically termed being hardened for the march by daily marches over any available roads near the post, the distances being gradually increased until they cover as much ground as is to be expected of them. To a certain extent this hardening must vitiate the test, as when an emergency arises, if the horses are not already hard there is little or no time for the process, and we can well imagine a battery being so crippled by several days' marching on unexpected orders as to be useless at a time when its services are urgently required.

TARGET PRACTICE.

I have had frequent occasion to refer to target practice in this paper, and, while it does not strictly speaking come within the subject of marching proper, I think it may not be amiss to conclude by a description of the practice of Light Battery "B," 4th Artillery, at Tyringham, Berkshire Co., Mass., last September (1895). We found a very suitable spot on top of the broad plateau between the Housatonic River and Hop Run, about 1800 feet above the sea. The target was set up on top of a cleared hill with gently sloping sides, and from the ridge on the opposite side of the valley we were able to get ranges of from 1600 to 2500 yards firing over a wide swampy bottom covered with a heavy growth of small trees and underbrush. The firing points were in fields that had formerly been cultivated, but had

been lying out long enough for a considerable growth of brushwood to appear, and they gave a good opportunity of testing the manœuvring capabilities of the gun in rough ground. The recoil was very much diminished by this condition, being seldom as much as six feet; this resulted in developing the structural weakness of the steel carriages, as it was found after the practice that the axles of all four were so much sprung as to necessitate turning them in; the stiffening plate evidently failed to support the axle in the manner intended. The other parts of the carriage behaved well during the test, though after firing several rounds and breaking through the turf the trail would bury itself in the ground.

The full allowance of ammunition was used, 20 shell, and 80 shrapnel, all being fired with the service charge of 3½ lbs. of powder. The general plan was to use the shell to find the range, then the shrapnel to do as much damage as possible to the target.

The practice took two days, 50 shots being fired the first at ranges of about 1500 and 1800 yds., and 50 the second at about 2300. It was thus divided as there were only 3 practicable firing points. The weather was bright and warm, the air clear and dry, with a light wind which grew quite strong during firing, blowing across the range on the first day, and almost a calm on the second. On the first day an observer was posted to one side of the target to correct errors in finding the range, and signal when it was correctly determined, after which firing with shrapnel was had under battle conditions, each gunner handling his own piece, without supervision. The observer's signals could be read only at the shortest range; at 1800 yds., on account of the small flag and the background, they were so difficult to make out, that on the second day no attempt was made, and observations at the firing point were relied on. All shells and a few of the shrapnel were fired deliberately, but at each range, after deliberate fire, the firing at will took place as follows: at 1500 yards,—16 shrapnel in 12 minutes; at 1800 yards,—12 shrapnel in 13 minutes; and at 2300 yards,—35 shrapnel in 29 minutes.

The results of the firing were, on the first day, about 1200 hits, and on the second about 600, some 6 or 8 of these being shell or shrapnel that passed through before bursting.

USES OF CAVALRY IN TIME OF RIOTS.

By Lieutenant ALONZO GRAY, 5th U. S. Cavalry.

IT seems to have been the prevalent idea in the United States until the present time, that cavalry was of no use in time of riots; and that infantry and artillery were the only arms which should be mobilized in our centres of civilization, at times of serious disturbance.

I have often heard such remarks as these, "Strikers will throw bombs at you, and your horses will become unmanageable." "They will throw rocks on you from the tops of houses." "They will throw torpedoes and shoot Roman candles among you, and demoralize you." I grant the first part of these assertions, and hope to show the fallacy of the second part.

Such remarks seem to fail in considering what the cavalry is doing while the rioters are acting their prescribed rôle.

What the cavalry can do under such circumstances, is what I hope to show.

Who first appreciated the value of cavalry in time of riots, I do not know. I am not aware, however, that it was used in this country before the summer of 1894, in Chicago.

It is on observation and information gathered there, and the later experiences of Troop "A," New York National Guard, in Brooklyn, that I draw the conclusions herein stated.

In time of riots, cavalry will either be stationed at posts near cities, or be assembled by rail from distant posts. If the former is the case, none of the difficulties of rail transportation need be considered. When the latter is the case, the troops at distant posts usually get a telegram to hold themselves in readiness, and within twenty-four, or forty-eight hours, get a telegraphic order to embark for the scene of difficulty. In the meantime the railroad company has been assembling cars at the nearest railroad station, so that, when the final order arrives, the troops embark without delay.

Trains conveying cavalry, usually travel in two or more sections. The first carrying horses, the second men. The stock train will always be ahead, and under the charge of a competent

and energetic officer, who understands something of railroading, and who is supported by detachments of men from each troop having horses on his train, as these men understand thoroughly the characteristics of each individual horse of their respective troops. The stable sergeant and farrier, are usually with each detachment.

The strikers usually have sympathizers in every town, who are apt to act under a leader, and who will do all they can to obstruct the movements of the train. As they are often railroad men, they have the advantage of the situation.

The railroad managers can always be depended upon to assist troops, and if possible, will furnish reliable train crews. If reliable train crews cannot be obtained, the military will have to furnish its own. In many cases it can impress a crew, and put it under guard, with the threat of instant death to any man who plays false.

A pilot train or engine will in most cases precede the stock train. The two sections should follow at intervals of about ten minutes. When the scene of trouble is reached, the last section should close up on the first, so that it can support it at any time.

The commander of the stock train will have to station a man over each coupling, with positive orders to shoot any unauthorized person who meddles with the coupling. Some cars have automatic couplings, which uncouple by a side lever. Such cars often furnish much trouble in crowded yards, as the person who uncouples the train cannot be readily detected. These levers can sometimes be wired down with hay wire, which is always present with the stock train. If this fails, the track will have to be cleared regardless of results.

It is much better for the command to disembark before it reaches the densely populated districts, and march to its assigned camp.

The passage of a stock train through a crowd of rioters is a hazardous undertaking, and should be avoided if possible. The rioters, at such times, have every advantage. They can dynamite the train, and then fire it; then the cavalry are lucky, indeed, if they are not transformed into foot soldiers.

The horses are either disembarked at a platform, or chute, or by the use of a portable ramp. Each cavalry command, or better, each stock train, should be supplied with its own ramp and not depend upon the railroad company to supply one. A

very suitable ramp for cavalry use, is a platform balanced on a single set of wheels, the wheels being flanged for the rails, and still capable of being hauled by a team from an armory or army post, to the railroad, where it is coupled to the rear of the train.

The position selected for a cavalry camp should be as open as possible, and located centrally to places where trouble might occur.

There is seldom any excuse for stabling horses. If rioters are at all energetic, a stable would, sooner or later, be burned; in any case its advantages could not compensate for the extra guard and trouble to protect it. If cavalry have successfully used stables, it was because the rioters were unorganized, or had a quarrel with the street car companies only.

There will seldom be any trouble about obtaining forage, as the class of men who supply the same have no interest in common with rioters. If, however, this method should fail, foraging parties can always obtain an abundant supply.

There seems to be a great deal of discussion of late about abandoning the sabre. I grant that it is useless in Indian warfare, and may, or may not be, in civilized warfare. I assert, however, that it is absolutely indispensable in time of riots, and as most of the coming cavalry service in this country will be in time of riots, it follows that the sabre must be retained. There is something about the look of a lot of bright polished sabres that the mob don't just exactly like. The thought of contact makes a chill run up each individual backbone. When this effect is combined with that caused by a line of excited, spirited horses, coming at a good stiff gallop, the meeting adjourns without a motion, and individuals tumble over each other in their haste to get away.

If any weapon is to be left at home, it should be the carbine. The usual result of firing at a mob is, that bullets go high, and kill innocent people who are a long distance from the crowd.

The revolver is *the* fire arm for a mob. It shoots low, repeats, is handy, and sufficiently accurate for the required ranges.

The method of marching through crowded streets, will depend upon the organization of the rioters. If they have reached that state of organization, where they are well armed, and barricade the streets, we turn the matter over to our friends in the infantry and artillery. The past riots have not reached that state, and as

they are not apt to, all the more will cavalry be needed for future riots.

Experience has shown that for blackguards, and stone throwers, a simple platoon front with drawn sabres, is sufficient. If the rioters have fire-arms, and shoot from windows, throw rocks, and otherwise behave as previously referred to, the following formation will be found effective :—

Start in column of fours. The first four remains intact, with sabres drawn, all numbers one and four, diverge, with sabres drawn, from the leading set of fours, to the sidewalk. Numbers two and three, march abreast of one and four, of their own set of fours, covering the intervening space, and with revolver raised, shooting if necessary at every head that appears at a window, or house top. It may be necessary for detachments to pursue rioters down side streets, but care must be exercised that the detachment be not cut off from the main body.

The rioters on the house tops, undoubtedly have the advantage, but so they would if infantry were in the streets.

The explosion of bombs does not have the effect of stampeding horses, as is popularly supposed ; firecrackers would do so much more effectively than bombs. The effect of a bomb on horses was well illustrated in Chicago, when the caisson exploded. The horses were trembling, and rigid, but none became unmanageable. Cavalry is much better suited to day work, than night. It will, however, ordinarily be effective at night and will most always be so if the streets are lighted.

The facility and rapidity of the movements of cavalry, make it especially valuable in time of riots, and when it comes to dispersing mobs without slaughtering, cavalry is the arm, *par excellence*.

They can charge a mob, hammer right and left with the flat, or edge of the sabre, leave many bruised, cracked, or split heads, but if they so will, they will leave few dead.

When infantry disperse a mob with bayonets, the mob can follow it back ; but cavalry can chase it, and resume its march before the mob discovers that it is not still following them.

Cavalry is valuable in escorting repair parties on trolley-lines, and as many trolley-lines now run United States mail cars, the regular cavalry can be called out for this purpose, as well as for the purpose of escorting railroad mail trains.

The duty of escorting trains, cavalry can also efficiently per-

form ; the rate of march of infantry makes it too slow to effectively clear the advance of a train trying to get out of riot limits, because the rioters can go as fast as the infantry. Cavalry, may however, strike obstructions such as rivers, and canals. In such cases it will usually be able to cross neighboring wagon bridges, and proceed with little delay.

The combined force of cavalry and infantry would be best for such purposes, the infantry being on the train, and the cavalry sweeping the tracks of rioters and obstructions.

When it is necessary to move troops quickly to some point a few miles distant, infantry will have to be used, as they can be embarked and disembarked quickly. Cavalry should never, if it can be avoided, be put on a railroad train in a locality where their horses can be destroyed.

Cavalry should never be used to guard stationary property, such as round houses, and public buildings, but should be kept where it can get its gait, and reach, and disperse impromptu mobs, and pursue them so effectively, that they cannot reassemble for considerable time to come.

Most rioters are not familiar with cavalry horses, and whether they are or not, they have no use for a charging horse, which knows neither union, nor corporation.

I have not attempted to disparage other arms of the service, but believe that each is invaluable and indispensable. I have, however, hoped to show, that cavalry is of some use beside chasing renegade Indians. Cavalry has, heretofore, been the advance guard of civilization ; it must now perform the equally important duty of rear guard.

Reprints and Translations.

REVIEW OF MILITARY TECHNOLOGY FOR THE QUARTER ENDING MARCH 31, 1896.

(*From the "Jahrbücher für die Deutsche Armee und Marine."*)

By Major JOSEPH SCHOTT.

Translated by Capt. Theo. A. Bingham, Corps of Engineers, U. S. A.

SMALL ARMS.

THE period of repose in this branch of science, mentioned in the Review for last quarter, still continues. No doubt progress will be made during this quiet both as regards diminution of calibre and as regards the development of self-acting or automatic rifles. There is no evidence, however, that even those nations which took the lead in introducing the new rifles, and consequently have been overtaken in the race by still newer systems, have any intention of another rearmament. While this is doubtless due partly to the extra expense, it is, no doubt, also true that the smaller calibres do not exhibit such a decisive advantage over the larger calibres as absolutely to compel such a sacrifice. The same also holds true as regards the proportionate reduction in weight of ammunition, although such reduction permits more cartridges to be carried by the men and the wagons without increasing the total loads.

Comparing the three calibres	11 mm.	8 mm.	6.5 mm.
Initial velocities =	430 m.	615 m.	710 m.
Height of trajectory at mid range for 500 m. =	3 m.	1.5 m.	1 m.
600 m. =	4.7 m.	2.5 m.	1.6 m.
1000 m. =	18.1 m.	10.1 m.	6.7 m.
1800 m. =	100.7 m.	53 m.	53.5 m.

The above figures show how materially the flatness of trajectory gains with reduction in calibre. This is also shown by the final velocities which at 2000 m. range are, for the above three calibres, respectively 92 m., 166 m., 202 m.

The weight of single cartridges for 11 mm. calibres, is 43 g.; 8 mm., 29 g.; 6.5 mm., 22 g.

The number of cartridges to be carried with the present form (European) of cartridge pouch is for the above three calibres respectively 80, 119, 160. Hence the value of the small calibre makes itself greatly appreciated.

Further progress will be effected by the 5 mm. calibre which has a velocity of 900 m. By using the sight, the 6.5 mm. calibre fully commands the front for 600 m. from the muzzle; but the 5 mm. fully commands the front up to 800 m. from the muzzle and without changing the sights. The cartridge weight of the 5 mm. calibre is 12.5 g., or but little more than half of

the same weight for the 6.5 mm. calibre. There are still difficulties in the way of manufacturing so small a calibre but no doubt they will be overcome. Whether the idea that small calibre wounds are not fatal enough will prove permanent is still very questionable.

France would be the first great power to undertake a rearmament because the Lebel is now antiquated not only in calibre but also in method of loading. The Daudeteau rifle would seem to have a good chance of adoption in such a case unless the very smallest then existing calibre should be decided on.

Sweden. The Mauser M/93 of 6.5 mm. calibre is the latest adopted. The cartridges weigh 23.14 g. by themselves or 25.2 g. with loader. This is a great saving in weight over the former altered Remington whose cartridge weighed 30.8 g. Hence a greater number of cartridges can be carried. This altered Remington, formerly used, was of 8 mm. calibre and used the smokeless powder apyrite, but was a single breech-loader. This Swedish Mauser is the latest Mauser model and has the magazine sunk in the stock. The five cartridges lie in the magazine in two rows alongside of each other. Before loading, the cartridges are held by a loading clip which does not enter the magazine. 4 kg. (=8.8 lbs.) of ammunition means 158 cartridges as against 129 carried before. The battalion cartridge wagons can now carry from 15,000 to 16,000 rounds as against the former 12,000.

Norway has adopted the Krag-Jörgensen rifle M/93—cal. 6.5 mm.

Weight without bayonet 3.95 kg.; with bayonet 4.19 kg.

Length " " 1.27 m.; " " 1.53 m.

Breech mechanism has a twisting motion and two supporting lugs.

Barrel has four grooves with a twist of 30.78 calibres.

The magazine, which is a horizontal box with a side door which opens downwards, is placed at the middle of the stock and holds 5 cartr idges.

The cartridge is 80 mm. long and weighs 23.6 g.—the charge is 2.3 g. of gun-cotton powder.

The bullet weighs 10.1 g.; the length is 4.92 calibres and it has a cross sectional pressure of 0.304 g. on the sq. mm.

Bullet velocity at muzzle=730 m. Highest gas pressure=3800 atms.: the sights read to 2000 m. The soldier carries 150 cartridges.

Holland has ordered 60,000 Mannlicher rifles from the Austrian factory at Steyr.

Automatic small arms have been described by General Wille in a pamphlet entitled " Self-Cockers." These weapons are defined as performing automatically all operations except filling the magazine, aiming and firing, by means of special devices whereby use is made of part of the gas pressure developed by each shot. By storing the energy of the gas pressure upon firing a shot, the piece automatically opens the chamber, ejects the fired shell and closes the chamber. Although these " self-cockers " render a more rapid fire than is possible with ordinary magazine arms this is not their chief value which rather lies in relieving the soldier of physical and mental exertion. Recoil is absorbed. It is a disadvantage that the arm keeps on working after ammunition is exhausted.

Four systems of these arms are constructed which differ by the methods of utilizing a part of the powder pressure for the automatic working. Some have a movable barrel, others a fixed barrel.

In the first system, the barrel moves to the rear (in some cases also with a turning movement), engages the breech-block, moves further to the rear, is automatically disengaged from the breech-block by a spring actuated by the rearward movement, and then flies forward into its normal position. The breech-block continues its movement to the rear until the chamber is fully open and the empty shell flies out. A second spring, actuated by the rearward movement of the breech block, pushes the breech-block forward into place and locks it, after the upper cartridge from the magazine has passed into the barrel and the firing pin has been cocked.

In the second system the barrel is fixed, and the breech mechanism separates from the barrel in one of two ways; either

(a) At the beginning of its movement to the rear, which is entirely in a straight line, or

(b) Before beginning the straight movement to the rear, by a screw-like turn which releases the breech mechanism from the barrel and takes a trifle more time than is required for the bullet to pass out of the muzzle.

All other arrangements are the same as in the first system.

In the third system the barrel is fixed and provided with a hole in a radial direction near the muzzle. Parallel to the barrel is fixed a tube into which a part of the gases of explosion pour through the radial hole, thereby pushing back a bolt. This bolt is so connected with the breech block as to open it, upon being pressed to the rear, and at the same time to actuate a spring. After the empty fired shell has been thrown out, the firing pin spring compressed and a fresh cartridge brought into position, then the spring compressed by the bolt in the parallel tube presses the said bolt again to the front, pushes the cartridge into the barrel and closes the breech.

In the fourth system the barrel moves to the front upon firing. Ordinarily the barrel is pressed by a spring to the rear against a sort of buffer plate which is part of the breech mechanism. Upon firing, in spite of the resistance experienced by the bullet in taking the grooves, a part of the energy exerted on the bullet is used to carry the barrel forward together with the bullet, thus leaving an opening out of which the empty shell is thrown. The spring which works on the barrel then presses it back into position against the breech-block, closing it over the fresh cartridge from the magazine which has meanwhile sprung into place.

To system 1 belong Mannlicher's self-cockers (some).
Count Freddi's "
Hugo Borchardt's pistol.
H. Maxim's original "half automatic."
Andreas Schwarzlos' pistol.

To system 2 belong some of Mannlicher's constructions.
Theo. Bergmann's pistol.

To system 3 belongs the noteworthy Cei rifle.

To system 4 belong two of Mannlicher's half-automatic pistols.
Also one of Mannlicher's rifles.

The *Armee-Blatt* No. 2 of 1896 says that the *Italian* navy will soon be armed with the Cei gas-pressure rifles which have penetrated 5 mm. tor pedo-boat plates.

Belgium. In spite of many failures the Hebler hollow projectiles still find many admirers, as is shown by an article in the *Revue de l'armée belge* for Sept.–Oct. 1895. "Notes d'un artilleur. II. Le projectile à canal," warn Belgium to begin making experiments with such projectiles as soon as possible both for rifles and cannon. (!)

According to the *Avenir militaire* successful experiments have been made with cartridge shells of "Marien" glas (gypsum).

Argentina. Pieper's factory in Liége are making revolvers invented by the Argentinian captain of artillery, Garcia-Reynoso. Loading and shell ejection are automatic, the five cartridges being loaded simultaneously and ejection taking place after each shot. A single motion of the trigger or hammer effects loading, firing and ejection. The magazine (5 cartridges) can be loaded at the same time as the revolving cylinder so as to be used as reserve ammunition. Escape of gas between barrel and cylinder is obviated by the Pieper device. The revolver has five principal parts: barrel, cylinder, stock, lock and magazine. The cylinder contains 6 chambers, the stock carries the whole. The lock includes firing spring, hammer, ejector and trigger. The magazine is attached on one side and is filled by a loader. The revolver has the following details:

Length, 260 mm.; barrel length, 165 mm.; sight on barrel; weight, 1 kg.; (2.2 lbs.); calibre, 7.65 mm.; grooves, 4. Bullet weighs 5 g.; charge weighs 0.3 g. Twist, 250 mm. Entire cartridge weighs 10.3 g. Initial velocity, 370 m. Loader with 5 cartridges weighs 56.3 g.

Diameter of mean hits for 10 m. range, 30 mm. Diameter of mean hits for 50 m. range, 250 mm. Penetration in pine, 170 mm.; at same distance 2 mm. of steel is penetrated. For ordinary cleaning only 2 screws have to be loosed; for complete overhauling the weapon must be taken apart making 30 pieces. This revolver can be used like any other or, by using the side magazine, like a carbine. It is fired directly from the cylinder, or the magazine can be used to load the cylinder.—*Revue de l'armée belge.* May, June, 1895.

Borchardt's repeating pistol (he is director of Löwe's rifle factory at Berlin) is now being thoroughly tested in the Austrian army and a new and improved model has been issued to the Vienna Rifle Club. The stock is at right angles to the barrel, the weapon has a T form which places the centre of gravity favorably and the pistol lies comfortably in the hand. The breech mechanism is similar to that of the Austrian mitrailleuse although each shot must be fired separately. Opening of chamber, cocking, ejection of fired shell, introduction of cartridge into barrel and closing of chamber —all take place automatically. The magazine (8 cartridges) lies in the stock and is filled from below. By means of a shoulder-frame the pistol can be turned into a carbine. Calibre, 6.7 mm.—*Armee Blatt*, No. 48 of 1895.

Roumania. Effects of 6.5 mm. bullets. Experiments were made with the Roumanian Mannlicher rifle M/93 for bullet injuries. Report was made

by W. Roth in his annual report on "Results and Progress in Military Surgery and Medicine."

The rifle weighs 3.8 kg. and has a steel covered bullet which weighs 10.32 g. and is 31.2 mm. long. The lead core of bullet contains 4% antimony. Powder charge is 2.45 g., bullet velocity 700 m.; final velocity 419 m. at 600 m. range and 202 m. at 2000 m. range. This rifle was fired with full charges at 8 living horses at ranges of 50, 100, 600, 1000, 1200, 1400 m. Other targets were metal plates, boards, trees, powder, paraffine, sulphur, 30 clothed corpses of men.

Out of 66 wounds inflicted on living horses and human corpses the following is deduced:

Entrance holes in the skin are 6-7 mm. diam. up to 600 m. range.
12-14 mm. " in single cases.
only 5 mm. " for ranges over 600 m.

These holes are round for perpendicular hits, oval for slanting hits. In other cases the hole depends on the tension of the skin.

Ricochet shots produce utterly irregular skin holes.

Exit holes in the skin are very irregular in shape and size depending on the internal organs passed through beforehand. When soft parts of the body are passed through, the exit hole in the skin may be as large as 5 mm.; when bones have been passed through it may be as large as 60 mm. The exit hole is seldom round and its edges are generally ragged and thrown outwards.

Holes through muscles are cylindrical, smooth and in longitudinal section often resemble mere linear defects.

If the bullet passes first through bone and then through muscle the latter is mangled more or less by the bone splinters.

In skull wounds at all ranges simple holes are not to be expected, but explosive effects, and it is a safe general conclusion that experiments of this kind with reduced charges are not reliable for predicating results in war.

It is not borne out by experiment that the small calibres are the most merciful. It is true that wounds in soft parts are less dangerous and the skin holes small, but the danger from bleeding is greater than ever for wounds of the vascular parts and of the lungs.

Italy. Effects of small calibre bullets. Experiments with the new Italian repeating rifle M/95, calibre 6.5 mm., confirm the above.

Effect of small calibre bullets. Kocher has written a pamphlet on the subject "Improvement in rifle bullets from the standpoint of Humanity" in which he says that if the object of modern war weapons be only to place the enemy *hors de combat*, then the arms of the present day exceed their requirements because they tear the tissues of the body in all directions or splinter the solid parts and so produce very dangerous wounds even in organs not the most important. They make perfect recovery doubtful or even impossible. Modern bullets have really become explosive bullets and should be forbidden by international agreement. The cause of the explosiveness of modern bullets lies in their initial velocity and because this may not be reduced, Kocher proposes in the interests of humanity that the degree of explosiveness should be reduced.

1. By reducing the calibre from 6 mm. to 5 mm.
2. By increasing the hardness of the point (steel point).
3. By sharpening the point of the bullet to produce easier penetration.
4. By increasing velocity of rotation of the bullet so as to reduce "tumbling" hits.

Madagascar—France. Effect of small calibre bullets. The French campaign in Madagascar furnishes but little experience as to the results of the Lebel bullets, because their enemies rarely made a stand against the French and were anxious to get away from the effects of French fire as quickly as possible. According to "*France militaire* No. 3490" the entrance and exit holes were very small for flesh wounds and scarcely recognizable. On the other hand bones were extraordinarily smashed and gave the impression as if high explosives had been at work.

CANNON.

France. A 12 cm. howitzer has been adopted in the field artillery and experiments have been made with it by 2 batteries. Regulations for the service of this gun have now appeared "Règlement sur le service du canon de 12 cm. court, approuvé par le ministre de la guerre le 28 mai 1895." The first communications in regard to the technical points of the gun appeared in "Leçons d'artillerie" published by Girardon, Paris, 1895. According to this the gun appeared in 1890 as a "short field-gun" M/90.

The tube is of steel, and with jacket and brake weighs 690 kg. (The *Avenir Militaire* of Oct. 12, 1895, copied by the *Mil. Wochenblatt* No. 114 of 1895, says these short 12 cm. cannon were used in the French manœuvres of 1895. This is a mistake. They were short 155 mm. cannon.

The carriage weighs 785 kg.; the limber, 890 kg.; total weight, 2365 kg. This carriage is in two parts. The upper part turns on the lower through 5° to either side by means of a traversing gear.

The gun tube rests in a jacket of bronze and recoils in it.

The breech of the gun is connected to a hydropneumatic brake fastened in front of the upper carriage. This brake checks recoil and by compressing the air in a special receiver called a "recuperator" enables the gun to run "into battery" again after a shot has been fired. The cylinder of this brake moves with the gun-tube. The "recuperator" is fastened to the bronze jacket. Recoil is limited by compression of air in the "recuperator" and never exceeds 47.5 cm.

Elevation and depression are done by a screw and range from —12° to +44°. The carriage has the plough brake under the trail and is also provided with a driving brake.

Rapidity of fire is 1 shot per minute slow, 3 medium, 6 quick fire.

This gun has two kinds of projectile, shrapnel M/91 and torpedo shell (obus allongé). The shrapnel has a bursting charge of 280 g. (according to another authority 320 g.) held in a chamber at its base and is filled with 630 hard lead balls each of 12 g. weight. Total weight of projectile, 20.35 kg.

The torpedo shell is 4 calibres long and filled with 6 kg. of melinite, and is distinguished from the shrapnel by its painted color.

The charge of the gun is powder B C (campagne) and has the appearance of horny flakes which are stuck together in bunches. These bunches come in three weights, viz., 550 g. for large (normal) charges; 330 g. for medium; 220 g. for small.

The shrapnel have the double fuse M/94, torpedo shells the percussion fuse M/88. The shrapnel is burst when used against living targets, but acts by impact against inanimate objects. The torpedo shells arevery suitable against earthworks, and weak masonry may even be overthrown by the gas pressure. Against living targets the torpedo shell are effective by their bursting fragments and also by the gas pressure.

The carriage is provided with seats on the axle, 2 men sit on the limber of the gun and 2 on that of the caisson.

There was exhibited at the Antwerp International Exhibition a 12 cm. quick-fire field howitzer on Schneider's system, described in the *Revue de l'armée belge* for May-June, 1895. The short recoil permits of continuous fire without the delay of running the gun "in battery." This gun can be used on any terrain, without a special bed even for high elevations; is easily aimed and fires accurately. The gun tube is of steel and fulfils the specifications of the French artillery. It consists of an inner tube with a thread for the breech mechanism; outer tube, and four hoops.

Recoil is communicated to the brake cylinder only through the outer tube so that the inner tube is less strained. The cartridge has a metal case. The projectile is centred directly, in front, and at rear has a guiding ring. The gun has 36 grooves of uniform twist, 8 mm. deep. The breech screw has two interruptions. Firing is done by a lock block containing firing pin, spiral spring and trigger, to which last the firing cord is fastened. A safety device prevents firing before the breech is completely closed.

The projectile, ordinary or torpedo shell, weighs 20 kg. and a charge of 2.1 kg. of black or 0.8 kg. of smokeless powder. Muzzle velocity=300 m.

The carriage has a hydraulic brake, a plough share under the trail and a driving brake which can also be utilized in firing. The hydraulic brake is Schneider's system, the gun tube running forward automatically into battery. Owing to the slight alteration of position, aiming after a shot takes but little time. The frame of the carriage is of steel plate furnished with spiral springs for throwing the gun back into battery.

The crew is 1 gunner and 6 men. The gunner aims and fires; 1 man works the breech mechanism, 2 men assist in pointing, 1 man works the driving brake, 2 carry ammunition.

The gun tube is 12.5 calibres long. Angle of twist $=7°$. Weight of gun tube and breech-block 455 kg. Carriage is 0.95 m. high. Total weight=968 kg. The gun tube recoils 14 cm. Recoil of carriage varies according to the soil.

The total weight of the cartridge is 25 kg. with black powder, 23.7 kg. with smokeless. Muzzle energy is 92 metre tons. The limber carries 16 rounds or 20, according to the powder; and the corresponding weight of the loaded gun is 2310 or 2410 kg. With 8 horses the draught load per horse is 295 kg., with 6 horses 393 kg.

Ten shots can be delivered in 3 min. 12 sec.; but with corrected aiming requires 4 min. 10 sec.

Switzerland has had a competition in which Lieut. Col. Pagan's cannon did best (Vedette No. 8). The calibre=7.5 cm. Length=2 or 2.2. m. Weight with breech-block=250 or 300 kg. The tube is said to be of nickel steel, wire wound.

In the longer gun of 2.2 m. (=29 calibres) the breech mechanism has a length of 20 cm.; loading space of 30 cm.; and rifled part of 170 cm. The grooves are 24 in number and of arched profile, 0.5 mm. deep, 7 mm. broad, with lands 2.82 mm. wide. The twist of the rifling begins at the rear with 2° (90 calibres) and terminates at a point 30 cm. in rear of the muzzle with 6° (30 calibres) and from there forward it is uniform. The loading space is 8 cm. in diameter, 29 cm. long.

The weight of the projectile is 5.8 kg.; carriage with equipment 320 to 270 kg.; of the gun ready to fire 570 kg.; of the limber with equipment 570 kg.; of the harnessed cannon 1140 kg. Four horses will be the team, and the draught load per horse with gun crew on the ground will be 285 kg.; with crew mounted 400 kg.

A battery will have 6 guns and 9,4-horse, caissons with 176-192 rounds per gun or 1056-1152 rounds for the entire battery.

Initial velocity of projectile=500 m.; total energy of muzzle is 73.9 metre tons or 167.5 metre kilograms per cm. of cross section or 296 metre kg. to 1 kg. of gun tube weight or 129.6 metre kg. to 1 kg. of the weight of the gun complete and ready to fire.

The work of recoil is 6 metre kilograms to 1 kg. of carriage weight. Average gas pressure=1900 kg. on the □ cm.

The projectiles are shells and shrapnel. The shells are of thin steel with large bursting charge and percussion fuse (torpedo shells). The shrapnel are of steel with powder chamber at the base and double fuses. They are filled with 263 bullets of hard lead each weighing 11 g. Total weight of bullets is half the weight of the projectile. The bullets are packed in layers and the spaces between them are either left empty or filled with paraffine. A furrowed ring serves to take the rifling.

The charge is 580 g. of gun-cotton powder in a woven bag.

The carriage is built in one piece, of steel plates. The wheels are from 1.3 m. to 1.36 m. high and weigh 60 kg. The axles are of steel and hollow, the middle of the axle being of rectangular cross section. The pressure of the carriage trail on the ground is about 50 kg., on the pintle hook about 30 kg. A steel shield is recommended. The limber has lighter wheels than the carriage but wheels are interchangeable. A change in the pintle hook and splinter bar is to be tried. The limber chest carries from 44 to 48 rounds.

Italy. In the Mountain Artillery, the 7 cm. shells have been abolished and will be replaced by the same number of "diaphragm" (chamber in the base) shrapnels. Each gun will be supplied with 274 such shrapnel and 10 case shot (including all ammunition trains).

Austria. 8 cm. howitzers for Mountain Artillery are being tried with good results.

Abyssinia. In the battle between Italians and Abyssinians on the plateau of Tigré quick fire cannon of small calibre were used on both sides. Two of the Italian mountain batteries had them. The calibre was 42 mm., the tube being of steel, 1.54 m. long and weighing 87 kg. The breech is closed by a turning block worked by a lever, the empty shell being thrown out upon opening. The charge is 81 g. of "filite." The projectiles are shells and case shot. The shells have double walls, a bursting charge of 35 g. of black powder, percussion fuse and projectile weight of 1.14 kg. The case shot have 68 balls of 13 g. weight each; total weight is 1.13 kg. The carriage and wheels weigh 218 kg. The gun can give 12-15 shots per minute. Projectile velocity is 475 m., and effective range 5000 m.

The shells yield 40 burst framents, each weighing about 25 g. which, even at a distance of 80 m. from the bursting point, will put a man *hors de combat.*

Facility of observation of hits is small, hence effective fire is difficult unless these quick-fire guns are used with regular mountain guns, in which case the results of fire of the latter can be utilized. Recoil in these quick-fire guns is completely absorbed, hence they require very little room.

The Abyssinians had Hotchkiss 37 mm. cannon. The tube is of steel, 84 cm. long and of about 34 kg. weight, with a vertically acting breech mechanism worked by a double handled lever. The projectiles are of three kinds: Shell, steel shell and case shot. The shells had percussion fuse and weighed 0.455 kg.

Powder charge (black) was 80 g.—velocity of shell, 402 m. Range was 1800 m. Carriage weighed 70 kg. The gun fired 12-15 shots per minute.

Th Italian quick-fire gun was therefore superior to the Abyssinian (Esercito Italiano. No. 7).

Germany. The following are recent changes in the matériel of the German foot artillery. That branch of it which have teams have now, 1. The heavy 12 cm. cannon with steel inner core. 2. The 15 cm. howitzer with steel outer tube. 3. The 21 cm. mortar with steel inner core.

In addition to the above the siege artillery has also (4) the 15 cm. cannon, and (5) the long 15 cm. cannon. Fortress artillery stil lretains the 15 cm. cannon, and the 15 cm. long mortar. The latter is also still retained in the coast artillery.

Fortress artillery has also a 21 cm. cupola howitzer and a 15 cm. cupola howitzer.

Coast artillery has the heavy 12 cm. cannon with steel inner core.

long 15 cm. ring or hoop cannon.

28 cm. hoop cannon.

long 15 cm. mortar.

28 cm. mortar with steel inner core.

Italy has adopted, and in spite of the small caliber, holds on to the 9 cm. siege mortar and has lately adopted for it a high explosive shell. The projectiles before adopted were shells and "diaphragm" (chamber in the base) shrapnel. The shells have percussion fuses, are like those of the 9 cm. field-gun and weigh 6.7 kg. The shrapnel is also like that of the field-gun, except for having a special time fuse, and weighs 6.96 kg.

The torpedo shell just adopted weighs, complete, 8.8 kg., and is 4 calibres long. It has a steel case into which the point is screwed. The bursting charge is 1.8 kg. of "eversite." Bursting follows from delayed action in a percussion fuse.

The charge of the mortar is fine grained powder in different quantities, varying from 50 g. to 300 g. for shell and shrapnel; and from 100 g. to 300 g. for torpedo shell.—*Mittheil über Gegenst, des A. & G. W. X.*, 1895.

Austria has adopted smokeless powder of 2 mm., 3 mm. and 5 mm. for the 15 cm. mortar M/80 in armored carriage and for the new 15 cm. battery howitzer.

ARMOR AND ARMOR PIERCING PROJECTILES.

The annealing of armor plates for boring holes through them, has lately been effected by direct application of the electric current to the spots to be operated on, 3-6000 ampères were used.

According to *Mitteil*, of Dec., 1895, the Putiloff works in Russia make the best steel projectiles. They are made of Tiegel (crucible) chrome steel according to Holtzer's French process. The material possesses a strength of 41 to 50 kg. at the limit of elasticity; a transverse strength of 86 to 97 kg. per □ mm.; and 6.5% to 8% extension in a piece 100 mm. long. The projectiles of 15-34 cm. calibre and 45 to 643 kg. weight have given good results against armor plates from 25 to 45 cm. thick, with striking velocities of 400 to 580 metres per second. In these days only chrome steel is suitable for armor piercing projectiles. A small amount of chrome added to carboniferous iron increases its strength without materially reducing its toughness; but a large amount produces brittleness. The effect of the chrome depends on the percentage of carbon. Chrome steel has been produced which had a strength of 157 to 163 kg.

Armored cupola from Creusot, 1894. This is for two 15 cm. cannon L/25 and a model of it was exhibited at Antwerp. The *Revue de l'armée belge* for Sept.-Oct., 1895, gives the following facts: The guns are so covered as to be liable only to port hole hits. The guns have "minimum ports" and are only visible for a moment which makes them harder to hit. The guns close the ports automatically and hermetically so that noise and smoke are excluded. The armor is of rolled iron and has the form of a flattened "calotte" (lawyer's wig). Moreover, a similar looking iron plate is fastened on the outside with many screws so that pieces which break off cannot come loose.

Traversing is done by the cupola itself which can turn completely round in 1 minute, so that the ports are visible only 15 seconds.

Elevation is from $-2°$ to $+25°$ and the gun can pass from one to the other of these limits in 30 seconds.

The guns, after a shot, return automatically to "in battery."

The armor consists of 3 layers and has a total thickness of 20 cm.; the outer iron plate is 4 cm. more.

Three kinds of fire are possible, viz.:

1. Cupola in motion, indirect aiming, automatic electric firing.
2. Cupola fixed, indirect pointing and firing by electricity or by hand.

3. Against moving targets, direct pointing from an observatory and electric firing by the man in the observatory who aims.

The glacis armor is of cast iron and 24-32 cm. thick.

The carriages have diminished recoil, hydraulic brakes and automatic gear for running "in battery." The gun tube weighs 3065 kg.; projectile 39 kg.; charge of 10 kg. of PB powder. Initial velocity=480 m.

MISCELLANEOUS.

Austrian production of steel has made great advances within the last year. The works of Witkowitz in Moravia and of E. Skoda at Pilsen are especially to be noted. The Vienna *Armeeblatt* in No. 29 of 1894 and No. 48 of 1895 gives much information on this subject. The former number speaks particularly of the Poldi works at Kladno in Bohemia which was first established in 1891 and by 1894 had delivered 19,000 metric centuers of rolled crucible steel. In 1893 the Italian Government ordered from Poldi 600,000 forged rifle barrels M/91, of which more than one-half have already been delivered and have withstood a gas pressure of 4000 to 5000 atmospheres.

These works have also produced a 7.5 cm. cannon of nickel steel. Italy has had from them tubes for 5.7 cm. quick-fire guns. For producing pressed hollow steel projectiles, the Erhardt pressing process is used. It is hoped to produce siege cannon of large calibre.

Count Thun's Streiteben steel works in Carinthia, produce steel projectiles of remarkable quality and as large as 24 cm. calibre.

The steel works of Böhler Bros. in Steyermark and Lower Austria also produce very good material.

The Witkowitz works make their pig from their own coal, getting the ore in part from Hungary. The pig iron destined for steel making is first partly reduced in a basic Bessemer converter, then made into steel in a Martin's oven, whence it goes to the rollers for the most part without cooling.

The steel for armor plates is prepared in special ovens and there receives the necessary addition of nickel. The billets cast from these ovens are compacted by strong hydraulic forging presses and then rolled down to the required dimensions; they then, by further pressing, receive the shape corresponding to the form of the ship, the surfaces of contact are planed to fit and finally they are hardened by a special process.

Steel projectiles (fuse shells) are made from billets of square cross section by the Erhardt process and the hollow interior is formed by means of a mandrel. The point of the projectile is forged.

These works have lately undertaken the production of seamless tubes which are drawn down from square billets by the Erhardt process. The desired strength is obtained by cold drawing. The coast defense vessel *Vienna*, launched summer of 1895 at Trieste, has nickel steel plates from Witkowitz.

E. Skoda's cast steel works at Pilsen have, for the last 10 years, been producing modelled steel castings. This factory began with war material by making cast steel carriages for quick-fire guns, and soon passed on to larger

carriages. Then came the successful construction of a quick-fire breech mechanism which was of great simplicity and safety; and then the works were largely occupied with the manufacture of quick-fire cannon. These works have for years supplied the Austrian naval ministry with their quick-fire guns up to 7 cm. calibre. The steel was furnished by the Poldi works, but all the work was done at Pilsen. These works have furnished the Austrian navy with carriages for 12 cm. and 15 cm. guns; the army with armored cupolas; and both with 8 mm. mitrailleuses. 12 and 15 cm. gun tubes can now be made here. There is a firing ground at the works which is to be adapted to guns of large calibre.

It follows from the facts given above that Austria is in a position to arm her field artillery with steel cannon independently of foreign countries. Before long she will be able to make her own middle calibres. But her navy will still have to purchase the heavy guns in other countries.

Ship and armor material can be got in Austria.

Nickel Steel. The Cologne *Zeitung*, No. 585 of 1895, gives the following interesting facts. Faraday in 1820 announced the possibility of combining nickel with steel, but this fact was long unused for industrial purposes. It is only since 1888 that successful experiments were made for producing nickel steel commercially in France; and later in England. In Germany and Austria nickel is added to melted iron; in France ferro-nickel is used; in North America the protoxide of nickel, reduced in a Martin's oven.

The addition of nickel to pure iron increases its strength and elasticity considerably. The greatest strength, viz.: 150 kg. is obtained with 15% nickel. When hardened in oil this rises to 195 kg.

By the further addition of chrome the strength is still further increased but so is also the brittleness.

Nickel steel is useful, first, for armor plates, then for cannon and rifle barrels; it is also valuable in shipbuilding and also for steam engines and boilers.

Nickel chrome steel is much used for armor plates and in 1891 the St. Chamond works patented such a process. The material is useful wherever hardness, toughness and good forging are required.

During the Fortress manœuvres of 1894 near Paris experiments were made with electric search lights. Details are given in the *Revue du Cercle Militaire*, Nos. 47-51 of 1894. The observer was at a distance from the light and controlled it electrically. It was found that sharpshooting and entrenching were much affected and hindered by this light.

The English battleship *Prince George* lately launched at Portsmouth is the largest ship yet built there. She is of 15000 tons, 130 m. long, 25 m. broad and of 9 m. draught, carries 2200 tons of coal and has an armored redoubt, aft and forward, each of which contains 230 cm. steel wire wound cannon. There are also twelve 13 cm. quick-fire cannon protected by 15 cm. hardened casemate armor. The ship also has sixteen 12 cm. quick-fire guns, two 12 cm. boat and landing guns, eight 1.1 cm. Maxim guns, four torpedo tubes, electric search and signal lights. The ship is also provided with armored deck and side armor and the two battle masts have each three 7 cm. quick-fire guns.

RECENT PAPERS ON AMBULANCE AND FIELD MEDICAL ORGANIZATION.

By Surgeon Captain C. H. MELVILLE, A. M. S.

(*Journal of the United Service Institution of India*)

(1) Medical aid in the first line in future war. By Dr. Hermin Fischer in Streffleur's *Osterreichische Militarische Zeitschrift*, May, 1894.

(2) The medical service with an infantry division in the field. Illustrated by a concrete example. By Major Alfred Hausenblas (General Staff, Austro-Hungarian Army). The same periodical, November, 1894.

(3) Our Sanitary Detachments, and their management in action as affected by modern firearms. By V. Kries, Lieutenant and Adjutant in No. 17 Train Battalion (German) in *Jahrbuch für die Deutsche Armee und Marine*, April, 1895.

THE above noted papers are of interest as giving an idea of how the question of the removal of the wounded from the field of battle in the future, strikes officers of Continental armies, and of the changes that they anticipate will be necessary, in view of the recent advances in armament, in that of the infantry in particular.

As regards the nature of the wounds that may be expected to occur, Dr. Fischer follows Habart's conclusions in general. He relates two highly interesting cases of attempted suicide in which the Austrian Mannlicher bullet (.315 calibre with a muzzle-velocity of 2034 foot seconds) entered below the chin, and emerged at the inner angle of one or other eye, passing in each case through the floor of the mouth, the tongue, hard palate, and nasal cavity, in one case also furrowing the frontal bone; both cases recovered completely. An essentially parallel case was reported by Surgeon-Captain Porter, A. M. S., in the British *Medical Journal* for February 16th of the present year, in which a Lee-Metford bullet after passing through the left upper arm, entered the head one inch below the inner angle of the left eye, and made its exit behind the right ear; in this case also the man recovered with only slight symptoms of paralysis of the tongue. The moral to be drawn from such cases, which Dr. Fischer I think misses, is that owing to their small calibre and great penetrative power, modern bullets can pass in the closest proximity to the most important structures without causing serious hurt, provided only that during their passage through the body, they do not meet with any considerable resistance, or do not pass through semi-fluid tissues. On the other hand, if they do meet with great resistance, the destruction they will cause will be directly proportioned to that resistance, and will be very far reaching and severe at all close ranges. Wounds thus will tend to be either excessively severe and probably fatal, or only comparatively severe or slight, according to the resistance they meet with in their passage through the body.

A very interesting quotation was made by Sir William MacCormac, in his inaugural address in the section of surgery, at the annual meeting of the British Medical Association this year, from a letter received from Surgeon-Lieutenant Evans, I. M. S., with regard to the injuries inflicted by the Lee-Metford bullets in Chitral. That officer states that all the cases of uncomplicated wounds of the soft parts healed rapidly and well, but that his patients accounted for there being no severe bone injuries under treat-

ment by the statement that "all the men who had suffered fracture of the long bones were dead."

From other statements, however, it would appear that even the long bones may be drilled through without serious injury to the surrounding parts. With regard to the proportion of killed to wounded, Dr. Fischer considers that this will be doubled, one in three instead of one in six, the average of the wars of the present century. He bases his estimate on the increased liability to hæmorrhage due to the clean cutting action of the modern bullet, and to the increased proportion that may be expected of wounds of the upper half of the body. The latter part of his argument is open to exception, wounds of the lung, as Dr. Fischer himself allows, will probably be less severe than formerly, and the statistics of modern wars show that the liability of the upper part of the body to be hit has not increased, and depends more on the presence or absence of cover for the lower limbs than any other factor. For instance, wounds of the lower extremities gave 332.8 per 1000 of all wounds in the Crimean war, at Sedan 440.4, and at Metz 406.8 per 1000, while in the Ashanti campaign, a jungle war, only 233.7 per 1000 affected the lower extremities.

The argument from increased liability to hæmorrhage is however undoubtedly sound, and by itself this factor alone might suffice to increase the ratio even to the point given by Dr. Fischer. He leaves out the obvious if somewhat grim deduction, that the greater the proportion of killed and wounded, the less work there will be thrown on the Medical Department and on the Ambulance Transport, and yet this point is one that should be kept in mind, since, in connection with the undoubted tendency of wounds, inflicted by the modern bullets, to be either very severe and probably rapidly fatal, or, on the other hand, comparatively severe or only slight; this consideration must affect to a considerable degree the extent of the arrangements necessary for the removal of the wounded. Dr. Fischer considers that the total number of casualties will be increased, and estimates them at 22 to 30 per cent. of the total forces engaged; this last average has only been attained on two occasions during the present century, by the Russians at Borodino, and by the troops of the same nation at Plevna, during the first assault on that town. Dr. Fischer bases his statement on an elaborate calculation of the probable number of hits to shots fired, he leaves out of consideration the very important fact that the upper limit of the casualties in an army is defined pretty accurately by the amount of suffering, physical and mental, that its component parts are prepared to endure before giving way, and that it is very doubtful if any large body of men, neither fanatics nor savages, could be found to stand up to a loss so severe as the above. Valentine Baker puts the breaking strain of the best troops at 30 per cent. and it is probable that before so high an average had been attained, a good many of the weaker links of the chain would have given way, when say as many as three army corps were engaged. It must be remembered that a 30 per cent. loss in say 100,000 men, means almost entire annihilation of some brigades, since it is not probable that the whole force will be equally engaged. That the troops which actually come under severe fire may lose 30 per cent. is not to be denied, but when the question of removal of wounded

comes under consideration, we must not leave out of sight the fact that we have the medical units of the reserve troops to fall back upon. On the whole, a general average of 10 per cent., will, I should be inclined to infer, be the highest we need anticipate. Lieutenant V. Kries agrees with Dr. Fischer on this point.

With regard to the position of the collecting station, Dr. Fischer very appositely points out that much must depend on the nature of the ground. In open country, where the field of battle is, as it were, the glacis of the enemy's position, it will have to be placed at least 2000 metres from that position; in broken or undulating ground it may be pushed up very much closer. The former distance must at once prevent any possibility of any regular removal of the wounded during the progress of the action. Some interesting experiments of V. Kries may be referred to here. Working over a distance of 350 metres between the position of the wounded and the collecting station he found that his weakest bearers began to break down after travelling 5600 metres, that is 8 double journeys, half of the way empty. The strongest were able to travel 7700 metres, 11 double journeys, and could have done more. Supposing the collecting station to be 2000 metres from the enemy, the average distance to be traversed will be 1050 metres each way, and the weakest stretcher bearers will begin to give in after 2½ journeys. After 3 double journeys a good number will undoubtedly be *hors de combat*. Taking the average amount that each man can do at 7000 metres, a very high average in all probability, we find each stretcher can do just short of 3½ double journeys; that is it can, at the very outside, bring in 4 patients. For each double journey half an hour roughly will be needed, including a halt for dressing the patient. It would probably be necessary to add at least a quarter of an hour for other halts. V. Kries found that the average extreme distance to which a stretcher could be carried without a halt was 1100 metres, but this apparently was not after several trips. It will be a fair calculation to allow three-quarters of an hour for each double journey. Then 4 such will take 3 hours, and at the end of that time the 25 stretchers of a British brigade would bring in 100 men, equivalent to 2.5 per cent. of the entire force; the 32 stretchers of an Austrian brigade would bring in a rather smaller percentage of their stronger unit. The point can be succinctly stated as follows: since each stretcher has four bearers, you can bring in as many wounded men as you have bearers, at the cost of completely exhausting four men. What the casualty list would be among these 100 or 128 stretcher bearers, walking leisurely for three hours behind a target exposed to magazine rifle fire, may be left to conjecture. Dr. Fischer takes as a concrete example a brigade 6000 strong; casualties 30 per cent. or 1800, of these 30 per cent. killed, remaining 1260 wounded, one-third of the wounded so severely injured as to be unable to walk. He allows 1 hour for each double journey, and calculates that of the 420, thus requiring carriage, the last 32 (there being 32 stretchers per brigade) would arrive at the collecting station in 13 hours. This is simply putting up nine-pins in order to knock them down. The reality is bad enough. Let us take our English brigade 4000 strong; 10 per cent. casualties gives us 400 killed and wounded, 30 per cent. of these killed

leaves us 280 wounded. Say 100 of these need carriage, then we can just manage it by completely exhausting our bearers, taking no account of their casualties while exposed to fire, and taking also no account of the wretched plight of the wounded being carried through a hail of ricochets and bullets passing through and over the fighting line, with every now and then a bearer falling wounded, or a stretcher pole cut in two. It must be further remembered that the bearers are not selected men physically, whether belonging to regiments or to the Medical Staff Corps, and the amount I have calculated for their being able to do is on the basis of selected strong men. There are two alternatives, either largely increase your bearer personnel which both Dr. Fischer and Lieutenant V. Kries recommend, or make up your mind that the removal of the wounded must wait till after the action is over.

Any great increase in the bearer personnel is hardly to be hoped for, nor do I think it is advisable. The more bearers you send under fire, the more you will lose; 200 men exposed for 1½ hours, or 100 men exposed for 3 hours, will give much the same total loss, nor do I think it at all fair on the wounded man that he should be exposed to the risks of that *mauvais quart d'heure* on his way to the collecting station; better die in peace where he lies, than be jolted across 500 or 600 yards of ground to fall off the stretcher with a bearer killed on the top of him, or a pole broken below at the end of it. Even in undulating and broken ground, where a certain amount of cover could be obtained for the stretcher bearers, a concentration of the wounded at a collecting station 2000 metres from the enemy, would probably be found impracticable; for every ascent or descent enormously increases the work of the bearers, and any advantage gained from a lessened roll of casualties would be practically nullified by the more rapid exhaustion of the men. Dr. Fischer recommends that light 2-wheeled carts be used in advance of the collecting station, to supplement the stretcher transport; but the use of any wheeled transport so close to the enemy is most objectionable. A loaded cart cannot travel out of a walk, and is much more vulnerable than a stretcher; 2 bearers out of 4 may be shot, and the stretcher still keep working, but one wheel broken, or one leg of the horse struck, and your cart is useless. In fact it will I think be found that the best method will be to give up all idea of attempting any systematic removal of the wounded until after the conclusion of the action. The wounded must be attended to where they lie, by the medical officers of the regiments of the fighting line, assisted by their regimental medical personnel; where good cover is obtainable close at hand, they can of course be removed to it as rapidly as possible, but any systematic concentration towards the rear must be abandoned. The regimental medical officer is in a more favorable position than the stretcher bearers, as he can avail himself to a considerable extent of cover, and has not to move in an erect posture in slow time.

Besides this there is another consideration: as I have shown, if you attempt to concentrate your wounded at 2000 metres from the enemy, each bearer can bring in one wounded man from the fighting line; if in doing so he is struck, he not only fails in his object, but he also diminishes the strength of the bearer company by 2, viz., himself and the man who has to

remove him, whereas a medical officer, before he is disabled, may have saved several lives by staunching hæmorrhage, and relieved much suffering by giving sedatives or even water. Naturally the loss among the regimental medical officers will be heavy, but so much stress is laid by all authorities on the necessity of having medical officers in close proximity to the fighting line, and the great moral effect that their presence there exercises, that it seems worth while paying even the high price that will in all probability be demanded for doing so. At the same time it is highly advisable that every man should be very carefully instructed in self-help, especially in the case of hæmorrhage, which will probably be the most fruitful source of mortality in wounds not immediately or rapidly fatal. Once the fighting is over, the wounded can be more systematically attended to. But now there will be no objection to moving, collecting and even dressing stations as close up to where the wounded lie, as the local peculiarities of the ground permit. Stretchers need only be used to convey the wounded to these stations from where they lie, a distance that will vary with the number of the roads in the neighborhood. In most districts in England these need not be more than a quarter or half a mile.

The difficulty that will now arise will be darkness. Lieutenant V. Kries insists very strongly on the necessity for practice in searching for wounded by night and the provision of large lanterns for this purpose. In the Austrian army, as shown in Major Hausenblas' paper, after an action each corps has a particular area of the battle-field told off to it to search for wounded, preferably of course that portion over which it has itself advanced. Dr. Fischer recommends a considerable increase in wheeled transport. It is doubtful if this is advisable. In the Austrian army very elaborate regulations are laid down by which commissariat and ration carts can be utilized for sick transport. Using these, they can, as in the case illustrated by Major Hausenblas, provide carriage for 128 wounded from the collecting to the dressing station, in 32 carts for each division. Any increase in the number of carts means a corresponding increase in sanitary personnel, as every cart should have an escort. Of course you can send off your carts in batches of 3 or 4, but on a dark night, on narrow roads, one man cannot look after all these carts and keep them together. The solution of the question seems to me to lie in the adoption of the Tortoise Equipment, or some similar form of light movable hospitals. By using some such arrangement a wagon can be sent along any field road to wherever there may be a collection of wounded, a hospital pitched at very short notice, and the wounded housed for the night. Any absolutely necessary operations can be then performed without the patient having been exhausted by a long preliminary journey in a stretcher across country, or jolting in a wagon down a rough country road. The subsequent fate of the wounded must depend largely on military considerations. If it is necessary on tactical grounds that the battle-field should be cleared of wounded as rapidly as possible, then of course it must be done, and the necessary transport provided. If this is not, however, absolutely necessary, the wounded may with great advantage to themselves be left in peace where they are, only such cases being removed as are hopelessly disabled and at the same time able to bear transport. For any

such scheme the organization of the British army is particularly well-fitted, being as it is, relatively weak (compared at least with the German army) in stretchers, but relatively strong in wheeled transport. All that is necessary is that definite regulations should be published, enabling free use to be made of empty commissariat wagons, and requisitioned country carts; it is understood generally that use would be made of these, but understandings are feeble things to depend on when time presses. The question should be settled beyond the possibility of mishap as in the Austrian army. Dr. Fischer and Lieutenant V. Kries both in my opinion fall into the same grave error. Assuming in the first place that the number of wounded will be largely augmented, an assumption quite void of proof, and recognizing that owing to the distances to which the lines of medical assistance will, in consequence of the increased range of modern projectiles, have to be pushed back, the labor of removal of the wounded will be greatly increased, they at once demand as the only solution of the problem a greatly increased bearer personnel, and more ambulance wagons. I do not myself see how an unwieldly transport column is likely to improve matters. In civilized warfare where the climatic conditions do not absolutely prohibit it, the wounded can very well be left with only rough shelter for the first night provided their primary wants of dressing and nourishment are attended to.

Even after that, the less they are concentrated compatibly with saving the surgical staff from an undue amount of work, the better for them. Removal can proceed leisurely as transport becomes available; much more harm than good is likely to be done by taking the pessimistic view that seems so common on the Continent as regards this matter of ambulance transport in the future. A compact, well organized train, regularly practised in peace in the work it will have to do in war, will do much more than a straggling, unwieldy mass of carts and stretcher bearers, too large for efficient supervision, and yet not large enough to get all the wounded under shelter and off the field before nightfall. Some of the wounded must lie out, however strong your bearer personnel may be (within the bounds of any reasonable allowance); it will moreover be physically impossible to collect all before dark, and those that lie out will not be necessarily only the slighter cases, they will be the most inaccessible. Much better for the wounded that the medical officers and stretcher-bearers should utilize the few remaining hours of daylight in searching for them, and administering necessary treatment and nourishment, than that they should expend all their time and labor in removing only a portion, even though they may be able to put these into positions of more or less comfort.

A pressing need in the Austrian army, as Dr. Fischer points out, and the same applies to our home army, is the want of highly trained medical subordinates. In the German army the *Lazareth-Gehulfen*, in the French the *Infirmiers*, and in the Russian the *Feldscheerer* supply this want: it is doubtful if any service is so well off in this direction as our Indian army, with its assistant surgeons and hospital assistants. It may seem rather brutal to suggest that the wounded should be left unsheltered for the first night, it is indeed a choice of evils, but I think anyone who reads the description of the villages on the field of Gravelotte during the night after the

action, in Richter's Kriegstagbuch, will feel inclined to deny that it is better to be out in the open in solitude, than crowded into the close stuffy rooms of filthy cottages, with the incessant noise of passing troops and trains, and a possible chance of being burnt alive. When possible, I think we should be guided by the principle of bringing the hospital to the patient, and not the patient to the hospital, and for this purpose the Tortoise Equipment is most advantageous. The most serious difficulties will naturally arise in those cases where the opposing forces are of mixed composition, European and savage, or when the inhabitants of the seat of war are savages. In such cases it will be impossible to leave the wounded scattered, and the ambulance transport and medical officers must be prepared for unremitting labor till their concentration is achieved. The wounded of the defeated side will always remain a great trouble. Between civilized nations it should be possible to arrange for the handing over of certain medical units, preferably those on the protected or unthreatened flank, to the victors in case of retreat. These, however, are minor points, the great cardinal fact which must rule all ambulance and ambulance transport work in the future is, that owing to the increased range of modern weapons, and the consequent increased distance that must separate the collecting station from the fighting line, if anything like a systematic removal of wounded during the progress of the fighting is attempted, the work of the stretcher bearers will be so increased that it will only be possible to bring in as many wounded as there are stretcher bearers available, at the cost of completely exhausting the latter, and taking at the same time no account of the probable casualties among them. There are two solutions of the problem, one to greatly increase the number of available stretcher bearers, the other to postpone the systematic removal of the wounded till after the action is over, and in short to bring the field hospital to the patient and not the patient to the field hospital. Dr. Fischer and Lieutenant V. Kries adopt the former solution. This solution involves the very great drawback of increasing largely the non-combatant personnel, and it is very doubtful if military leaders would sanction such an increase. The second alternative is open to the objection of leaving the field of battle encumbered with wounded. On surgical grounds the less concentrated the wounded are the better. The question must be decided by military men: if they wish to have the field of battle cleared during the progress of the action, they must provide the increased transport or rather sanction the increase; if not, the means at present provided should be sufficient. Lieutenant V. Kries insists on at least a fortnight's training a year of all stretcher-bearers in field work, in addition to their instruction in first aid and nursing duties. During this time they should be exercised with a force of all arms, separate tactical ideas being brought into play on different days. Special practice in night searching is also necessary, and Lieutenant V. Kries suggests that portable electric lanterns, the elements being carried in a knapsack, should be specially provided for this purpose.

Major Hausenblas' paper is most interesting, but too long and too detailed for ready condensation; it goes most carefully into all the minutiæ of the medical arrangements of an infantry division of the Austrian army

operating independently, during the day preceding, and the day of, an engagement. Almost simultaneously with the publication of this paper new regulations were published for the Austrian medical service which considerably affected the position of its officers. For instance, in detailing the work of a collecting station Major Hausenblas gives as the commandant of the collecting station, to which five medical officers of various ranks were attached, a corporal of the sanitary division; all orders to the sanitary personnel, not of a purely professional nature, had to be given through or by this corporal. By the new regulations the senior medical officer of a sanitary unit is its commandant. I have already indicated what seems to me the best feature of the Austrian system, viz.—the very careful regulations providing for the use of empty commissariat wagons for sick transport. In other points the system does not recommend itself. To take, for instance, all medical officers away from their regiments, in order to form an unwieldy collecting station, seems a mistake. Major Hausenblas recommends the formation of a larger number of small collecting stations, and also that one medical officer for every regiment of three or four battalions, should accompany the fighting line. It is doubtful if this is enough. The French and Germans, like ourselves, send a medical officer for every battalion under fire. Of minor matters the detailing of three cavalry orderlies for the use of the divisional P. M. O. is worthy of note. Major Hausenblas touches on the great difficulty of providing for proper attention to the wounded of the cavalry during the preliminary scouting, but makes no very practical suggestions on the subject. This difficulty which must have struck all medical officers who have taken part in cavalry manœuvres is one that needs more careful consideration than it seems to have received so far. Brigade-Surgeon Williams of the New South Wales military forces, read a paper on the subject before the U. S. Institution of that colony in 1891, but his recommendations were on too liberal a scale for practical adoption.

SOME ASPECTS OF COAST DEFENSE.

By Lieutenant Colonel J. R. J. JOCELYN, R. A.

(*Journal of the Royal United Service Institution*.)

THE tactics of coast defense is a wide subject, involving much that an engineer or a sailor is more qualified to deal with than an artilleryman, so that I propose to confine myself to my own arm; but even with this restriction, time will not admit of anything like completeness of treatment, and I feel obliged to crave indulgence for a certain want of coherence and continuity that, doubtless, will be detected in my remarks. I would, however plead in excuse, that coast defense is no longer an unfamiliar subject, in view of the many excellent lectures that have touched upon it in this theatre, during the last five years, and, in addition, that it is possible, I shall best employ the time at my disposal, in directing attention to certain points of interest or importance at the present time.

The fighting units of coast artillery may be simply stated: the smallest is the group, which should be composed of two or more pieces, under the command of a group officer; an assemblage of two or more groups constitutes a fort, under a fort commander; while two or more forts make up a section, under a section C. R. A. All the guns of a group should have the same field of fire, all the groups of a fort should command the same waterway, all the forts of a section should fire on the same line of approach. There are other officers, and other commands and modifications of commands, but this is practically the chain of responsibility, and the object of the organization is to bring every piece into action, with its proper ammunition, as soon as it can bear on an enemy, to keep it in action till all objectives are disabled or out of range, and to accomplish this end as quickly as possible.

Certain subjects connected with this essentially artillery aspect of coast defense may be presented to you, as pegs whereon to hang discussion; they are as follows: The selection of guns and mountings; the placing of guns; the control of guns; the choice of ammunition; the laying of guns; what we may expect from guns; the action of guns at night; requirements for training personnel. I do not propose taking them *seriatim*, but in such order as will most conduce to brevity and clearness.

I. THE LAYING OF GUNS.

In order to lay a gun correctly, the range and training which will cause the projectile to hit the objective must be known. Now no range or position finder in existence is able to give us this information. Something else is necessary.

The Three Service Methods of Gun Laying.—There are three Service methods of gun laying, known as Cases I, II, and III, each of which, in turn, becomes suitable, as conditions change.

Case I.—The tangent scale is raised to the proper height, and the gun layer is responsible for line and elevation. The position finder (P. F.), or the depression range-finder (D. R. F.), can be employed to measure the distance of the object. The advantages of this method are, that it is independent of rise and fall of tide, and is more accurate than quadrant elevation; also from a high site, errors in range, are minimized by its use. The disadvantages are, that it depends greatly on the visibility of the object, and personal error is apt to creep in. As the gun layer is obliged to jump clear before the gun is fired, and as it is more difficult to keep on the object than when only laying for line, it is less rapid than Case II; it is unsuited to salvo fire, and is awkward at night, on account of the difficulty of seeing the graduation of the scale.

At present Q. F. guns have always to be fired by this method; it should be employed for all guns, when the range is not accurately known, or if instruments break down, or are out of adjustment.

Case II.—The proper quadrant elevation is given to the gun, under the superintendence of the gun captain, while the gun layer, standing on a sighting step, lays the gun for line by aid of straight-edged sights.

The P. F. or D. R. F. can be used to measure the distance of the ob-

ject. The advantages of this method are, that the gun can often be laid correctly when the view of the object from the gun is much obscured; the division of labor, in laying, eliminates personal error, and tends to speed and accuracy; it is convenient for salvo fire and night work, the gun layer remaining on the step, when the gun is fired, and having no scales to alter. Its disadvantage is, that if the correct range is not known, the resulting error will be greater than with Case I. Case II is the normal method.

Case III.—The sights are not used, and the gun is laid by quadrant, elevation and training arc, for what is called "predicted firing." It is only possible with the P.F. This instrument can be made to predict the proper range and training at which to fire, before the time for firing arrrives, this information being exhibited on group dials, which are in electric communication with the instrument. Quadrant elevation is given under the superintendence of the gun captain, while the gun layer sees that the mounting is traversed, until its pointer is at the proper position, over the graduated arc, on the gun floor. At the proper time the gun is fired electrically. The advantages of this method are, that a gun can be fired at an object totally invisible to, or only seen with difficulty from, the gun floor, as long as it can be made out by the telescope of the instrument. The invisibility may be due to smoke, haze, or the way the gun is mounted or placed; the partial invisibility, to long range or temporary meteorological conditions, such as a hail storm beating in the face of the gun layer. Its disadvantages are, that in general, guns shoot better and more rapidly when laid by aid of the sights, especially if there is any great "displacement" or distance between the instrument and the group it serves. There are other technical points that I need not touch on. This method would be used with advantage for direct long range salvo fire, and, at all times, when guns are specially mounted for high angle fire; occasionally it possesses advantages at night, and must always be resorted to, when laying by direct vision is impossible. It is, in every case, a valuable alternative to the other cases.

Now, in all three cases, the proper range, and in Case III the proper training, in addition, must be exhibited on the group dials. Either the P.F. or the D.R.F., when in proper adjustment, can measure with great accuracy the distance between an object and the pedestal on which the instrument is placed; the former can, in addition, determine the distance between the object and the pivot gun of the group; but more than this is required; the fort commander is obliged to apply certain "corrections" to the information given by the instruments.

The Powder Correction.—Great strides have doubtless been made in the manufacture of powder, and, if only proper precautions are taken in sorting and weighing, very regular shooting may be looked for, on any given day, from any given batch of powder; but the strength may vary from time to time, and generally a correction has to be made, at any rate at first, until the guns get warm. We may, however, note in passing, that bad results are often ascribed to what is called "error of the day," which are really due to bad adjustment of instruments, defects in loading, and the like. The powder correction has to be considered, with all three cases, whether P.F. or D.R.F. is used.

Tide Correction.—Whereas tangent elevation is unaffected by height of site, quadrant elevation scales have to be made out for each fort; they are constructed so as to be suitable for the height of the work, above mean tide; alterations in the level of the latter will sometimes cause serious alterations in range. The necessary allowance will increase with the difference from mean level, in the height of the tide, and the sharpness of the angle at which the shot strikes the water. Other things being equal, low sites and short ranges increase the importance of this correction. It must always be considered in Case III, and also in Case II, whether P.F. or D.R.F. is used. It does not come in to Case I.

The Correction for Travel of Objective.—This correction must be considered in Cases I and II, whether P.F. or D.R.F. is made use of. We will take the case of the D.R.F. first. Before the group officer orders any range to be put on his guns, he must compensate it for the difference between the distances of the object from the instrument and the pivot gun, and this he does by applying a "group difference," previously laid down, which depends on the displacement and the way the gun is pointing (see Fig. 3). Having regard then, to the time, when it will be his duty to fire, and also to the way the range is changing, as shown on the group dials, he gives a certain range, corrected for difference, to his guns, and orders them to fire when the range itself appears on the group dial. But before this can take place, the following course is followed: The observer at the telescope T (see Fig. 1), follows the object, while another man watches the range drum of the instrument, and calls out ranges, in such a way and at such intervals, as may have been ordered by the fort commander, and in obedience to these calls, a third individual moves a large dial, close to the instrument, known as the fort commander's dial. A fourth individual copies on the group dial, the movements of the fort commander's dial. When his selected range appears on the former, the group officer orders his group or gun to "commence firing." The gun layers see that their line is correct, and throw up their arms in Case II, or quickly finish their laying and jump down in Case I; at either of these signals, the gun captains involved, order their guns to fire, and the Nos. 4 pull the lanyards.

Next suppose the P.F. is finding the range. Almost the same procedure is followed, except that the group officers have not to correct for displacement. The observer at the P.F. telescope, T^1 (see Fig. 1), having manipulated the instrument as ordered by the fort commander, follows the object and the group dial exhibits ranges. These are called out, at intervals, by the dial readers, and when the selected range is heard, the group officer orders his group to commence firing, and gun layers, gun captains, and Nos. 4 proceed as above detailed. The P.F., thus, saves group difference and three of the operations, necessary in the former case.

The time taken up in this transmission of the range is called the "time of firing," and depends on the fort and the smartness of the men.

After the gun is fired the "time of flight" has to elapse before the shot strikes, and both during this period, and the "time of firing" the position of the object may alter, the necessary allowance depending on its speed and direction. This correction is not required with Case III.

In addition to these corrections for range, there are others that refer to training.

Training Corrections.—In Cases I and II, either with P.F. or D.R.F., these corrections are made by giving a certain amount of deflection on the leaf of the back sight. They are necessitated by the effect of wind and the angular travel of the object during the time of flight, in Case II, or the time made up of the latter and that taken by the gun layer to complete the laying, in Case I. In addition, if the bow or stern wave is made use of as a lay point, deflection may be necessary, to bring the projectile to a certain part of the ship. In Case III not only have the above effects to be considered, but drift has also to be taken into account, as the gun is not laid by aid of the sights.

The Responsibility of the Fort Commander.—Now, with the exception of the group difference, all these corrections have to be evaluated and applied, either by or under the authority of the fort commander. Not only has the range to be measured by the instrument, but the net correction has to be arrived at, and matters so arranged that it is not a distance only, but a corrected distance, that is transmitted to the group dials. So also as regards training; the gun layer is responsible either for the line over the sights or the position of the pointer, but the fort commander governs the movements of the deflection leaf, or takes measures, in Case III, that the necessary corrections are embodied in the transmitted training. No instrument absolves the fort commander from this responsibility; corrections always have to be made, they only differ in kind. When firing has commenced, observation is the great aid to correction; but the above disturbing effects are not constant in their influences, and have always to be borne in mind. It is unfortunate that but little real experience in observation of fire can be gleaned from our so-called "service practice."

The Position of the Fort Commander.—Now arises this question: as the correction and observation of fire is so difficult a matter, how can its performance by a fort commander, be reconciled with efficient and disciplinary control of his men? My contention is, that the two things are perfectly compatible, if proper arrangements exist in the work, and if the officer is able to regard matters from the standpoint of their relative importance for the time being. The first necessity is a properly chosen station, inside the fort, for its commander, its requirements being as follows: There should be a clear view of the waterway commanded by the fort; in an open work, gun emplacements should be in sight, if possible, but at all times they must be within easy reach; there should be a pedestal for a D.R.F., an instrument that should always be at hand, whether the P. F. is installed or not, but the distance of this pedestal from the furthest group should not exceed 200 yds., for if it is greater one set of group differences will not be sufficiently accurate for all ranges; the station should be roomy, weather proof, clear of the blast of the guns in firing, and be provided with a table to hold maps and other useful articles; it should be connected, electrically, with that of the section C.R.A., while easy means for communicating ranges, orders, etc., of the kind best suited to the individual work, should exist between the fort commander and his subordinates. Sometimes two stations

of this sort should be provided, ether for the avoidance of smoke or other reasons. In an open work it is often possible for a fort commander to have the greater part of the armament under his eye; in a casemated work, he is bound to be on the roof, but even there, he is practically as much with his men as if he were actually on the gun floor, where probably two detachments at most would be aware of his presence. The true power of an officer over his men is obtained by his methods of dealing with them and their knowledge of his character, and the conviction that he will know how the work is going on, when not actually on the spot. It is only during firing that he need be at his station, but in action it is no more necessary for him to be looking after petty details of drill, than it is for a squadron leader in a cavalry charge, to concern himself with the dressing of the rear rank. We must demand something from discipline. I put it forward as an axiom, that as long as a fort commander is inside the work, he is in touch with his men.

When the P.F. is being used as the range finder an apparent difficulty arises, in carrying on the work, from a station as above described, but it is only an apparent difficulty. In order to obtain the full value of this instrument, it is generally installed outside the fort, so as to be removed from the effect of smoke,* and, formerly, it was the invariable custom for the fort commander to place himself at this observing station, leaving a sub-commander to represent him in the work. Now it must be understood that each group of guns has its own P.F., and the "gifted individuals" who work them are not "trained officers of iron nerve and wide experience," but simply young gunners or N.C.O.'s of good eyesight and intelligence, who are instructed as "specialists," and paid as such; they are, in fact, glorified gun layers. Moreover, most works, where the P.F. is installed, have two or more groups, and as it was impossible for the fort commander to be with more than one instrument at a time, he usually stationed himself in some convenient central position, whence he could see the waterway and communicate with his observers, by voice or orderly, generally by the latter. There is no reason he should not do, from this station in the fort, all that he used to do at the observing station, and at the same time have a most efficient control over the fire.

We have just commenced to use portable telephones, and last year very good results were obtained with the Siemens-Halske, when officers were not afraid to use it. In the past, telephones have been discredited a good deal by bad selection and improper usage. Lines seldom go out of order; they should be laid permanently, and admit of being tapped readily, terminals being placed at all necessary places. Receivers, transmitters, bells, etc., should be kept in store, and joined up only when the fort is got ready for action; it is essential that all their parts should be easily accessible to inspection, nothing closed up permanently, and all "gimcrack" fittings forbidden. Telephony has made great progress in civil life, it should be easy to supply the wants of the coast artillery.

The essentials, then, are good telephones and sufficient practice and that

* By placing guns and instruments at different levels, mists, peculiar to certain localities, are prevented from interfering with the laying.

being understood, the fort commander should be at no disadvantage, as far as his observers are concerned, and be also in the best place for fire control. The method works with the greatest ease, when this officer speaks directly to a sub-commander at the observing station, telephone orderlies and all the old cumbrous method, being discarded.

Moreover, it may sometimes happen, that certain corrections can be better made by a sub-commander at the P.F. observing station, or even by the observer himself, than by the fort commander. At such times, the latter should not hesitate to avail himself of their services; the utmost flexibility of procedure should not only be allowed, but be practised, for, whether it be permitted or not, assuredly the fort commander will avail himself of it in action, not from any want of respect for established order, but from the force of circumstances. In making use of the eyes and positions of his subordinates he delegates but does not abrogate his functions; he should always hold the strings, for his office is to command, but, as they say in the law, *qui facit per alium, facet per se.*

Gun Laying with Time Shrapnel.—There is a fourth method of laying, which might be employed with time shrapnel against quick objectives. It consists in preparing salvos of time shell for several suitable ranges, following either with P.F. or D.R.F. and firing, when a certain range, corrected as usual, comes on the dial, the gun layers having kept the sights on, for line.* Electric firing from the P.F. observing station could sometimes be used with advantage.

Gun Laying without a Range-finder.—If the gun is any height above the sea, 100 ft., say, or over, a combination of quadrant and tangent elevation serves as a rough range-finder; that is, the quadrant elevation, for some range, short of an approaching object, is given to the gun, and the tangent scale is run up to the corresponding graduation, and the gun is fired when the line over the hind sight and fore sight passes through the object. I believe Colonel French, late Chief Instructor at Shoeburyness, has been working at a range-finding sight on this principle; if successful it would appear to fulfil a desideratum with Q.F. guns.

Under this heading of the "Laying of Guns," I wish to draw attention to the following points:

1. That the "fighting" of guns in a fortress differs materially from either sea or field service, and points to the necessity for regimental training.

2. That continual and more extensive practice is required by officers in choosing the proper methods of fighting their guns and changing without friction, from one system or "case" to another.

3. The necessity for a common-sense view of the duties of fort commanders, so that they should not be tied down by pedantic considerations.

4. The fallacy of laying down anything like fixed universal rules in the matter of communications.

5. The necessity for experiments to find a suitable telephone.

6. The proper understanding of the real use and position of range instruments.

*It is only at very short ranges, and when the object is moving swiftly across the guns, that this presents any difficulty.

II. THE CHOICE OF AMMUNITION.

This is, generally, the duty of the fort commander. At one time there appeared to be a good deal of complication connected with this subject; we will soon, I think, be content with very simple rules, and the first of them would be, that the normal projectile for coast artillery is a common shell with a direct action fuse.

Common Shell.—The efficiency of this projectile is unquestioned, (1) against horizontal targets, at long range, or when fired from guns mounted for high angle fire, especially in salvos, and (2) against all unarmored or lightly-armored portions of the vertical target. There is, however, a point which appears doubtful to some, and which, at all events, would be better for elucidation. Since, in the case of direct fire against a ship carrying any armor, common shell striking the vertical protection, near the belt, would be wasted, our object should evidently be to pitch the shells well up, so as to secure hits above the impenetrable portion. Now come the questions—How will common shell behave that fall on an upper deck at angles of, say, less than 10°? What will their effect be, if burst by striking deck hamper? Can we count on their penetrating the structure to any great extent before they burst? Seeing that the deck, especially to guns on a high site, furnishes the greater part of the virtual target, as the enemy approaches, the possibility of its efficient attack, by direct fire, is very important. From this it appears that shells should be as heavy as possible, and it is open to question if it would not at times be wise to adopt reduced charges to insure a steeper fall for the projectiles.

Armor-piercing Shot.—With regard to armor-piercing shot, I think it is fully realized that, unless the armor is very much over-matched, they should not be used. The comparative immunity the *Huascar* enjoyed, with her 4½-in. iron plates, against the 9 in. guns of the *Shah*, has already been quoted in this theatre. Indeed, there appears to me but two occasions when the use of the armor-piercing shot is indisputable: (1) When by use of high angle fire, we can make sure of penetrating the horizontal armor of an anchored ship; (2) when battle-ships are pressing home an attack, and their range and position render their "vitals" vulnerable. This, of course, leaves out of consideration a lucky shot under the belt during a roll, which I presume, is a matter of pure chance. Of the above alternatives, the second is not likely to occur often, but suppose it were to, it appears to me that even then, all but the heavier guns should fire common shell or percussion shrapnel against the deck perhaps, but certainly against any insufficiently-protected portions, or the vertical target.

Shrapnel Shell.—That shrapnel shell, with a percussion fuse, could often be used as common shell, has always been recognized; but, not long ago, time-shrapnel was a discredited projectile; it may be the natural answer to a torpedo-boat attack. It is said that the balls are effective up to 300 yds. from the point of burst, but as their individual weight varies in different heavy shells from 2 oz. to 8 oz., it appears desirable to determine by experiment what is the lightest ball that can be relied upon to penetrate modern torpedo-boat plates up to 3000 yds. range, say. Naturally the lighter the

ball the greater their number, and the more extended their effect. The next question would be—What height above plane should the shell burst to be most effective against the actual target presented, for I think it would vary with the class and position of the boat. When the balls of a shrapnel strike the water, their "pattern" may be enclosed in an elongated oval something like the figure (see Fig. 2). The relative dimensions of this figure vary, of course, with the range and height of burst, but it is found, I believe, that the balls are much more closely packed towards the rear, and that about half would fall within the shaded area, which may roughly be described as circular. Experiments of this sort could well be carried out over a sand range, and from their results, local schemes could be drawn up, which would depend on armament, waterway, and probable line of attack.

Case Shot.—This is a deadly projectile, at close range, against anything floating that is not absolutely protected. However, opinions differ as to its efficacy against light armor, such as torpedo-boat plates; experiments appear necessary in order to lay down limits of power and range, and also to determine the best sort of ball.

Cartridges.—On mobilization, as soon as a fort is confided to an officer, the largest batch of cartridges of similar brand should be examined and weighed, and the whole of the ammunition should be carefully inspected and arranged, so that by no chance should any alteration in its service take place, without the fort commander's knowledge. Rounds at known ranges should be fired as occasion offers.

Under the heading of "Choice of Ammunition," I wish to draw attention to the following points: *

7. Can vessels be efficiently attacked by the direct fire of common shell and percussion shrapnel on their upper decks, and how far can we utilize reduced charges?

8. With regard to our own defenses, are there many places where the close attack of battle-ships is possible or probable, and how far should this affect the equipment of armor-piercing shot?

9. Are there occasions where a blow from a solid projectile would be more detrimental to an unprotected ship than a common shell of the same calibre burst inside her?

10. The necessity of experiments to obtain data as to time-shrapnel and case shot.

III. THE CONTROL OF GUNS.

The objectives of coast artillery are either (A) vessels at anchor or (B) vessels in rapid movement.

Under A may be classed—

(1) Ships carrying out, at long or medium range, a systematic attack on forts, or attempting to bombard something defended by the forts.

(2) Ships supporting by their fire other ships attempting to run past the forts.

(3) Ships that have anchored at short range to effectually crush forts.

Under B may be classed—

* These points are numbered consecutively through the lecture to facilitate reference.

(1) Ships that attempt to run past and at the same time fire on the forts.

(2) Ships that attempt to run past without firing.

Control by Section C.R.A.—In A (1) systematic fire tactics could be opposed to systematic attack; careful identification of the enemy would be carried out, and objectives and even projectiles would be notified to fort commanders; the section C.R.A. would hold a rigid control as long as possible, and distribute his fire to the greatest advantage. The usual installations of telephones and charts, or telephones and indicators, meet the requirements of this service.

In the case of A (2) the control could not be so rigid; the duties of the section C.R.A. would be restricted to seeing that while the supporting ships were kept under fire, the true attack was not neglected.

In case of A (3) taking place, control would have passed into the hands of the fort commanders, as it must whenever the objectives have rapid movement; then, control by the section C.R.A. would be liable to lead to confusion.

Looking at what our probable duties in war will be, from a common-sense point of view, it appears to me that in the majority of cases the duties of this officer will be more preparatory than executive, but they are duties of the highest importance. Apart from those of any military commander, he must see that his section is properly organized and prepared, that ammunition is sorted and ready, that range-finding arrangements and communications are complete, and possible breakdowns provided for; he must take especial care to keep himself in touch with coastguard stations, etc. Immediately on mobilization, he would consider the plans that should have been drawn up in peace time for his guidance, and see how they should be utilized or modified, in view of present events, and then, he should explain to all his fort commanders, as far as it is possible, what their action should be, in case of probable eventualities. Here naval assistance would be invaluable.

Coast defenses designed to prevent ships running past, would usually have the section C.R.A.'s position well advanced; he would thus, when an attack was imminent, be often able to send useful information to his subordinates; during the actual attack he might find it necessary to draw attention to any vessel that appeared to be escaping punishment, but beyond this he could scarcely go. If the time for interference and non-interference is not thoroughly understood, great confusion might arise, especially if an officer, new to the work, suddenly found himself in command. The telephone is a dangerous plaything.

Control by the Fort Commander.—In the great majority of cases, the fort commander will control the fire of his fort; that is to say, he will exercise full discretion as to when, what, and where to fire, except in so far as he is restricted, either by orders previously given, or by the propriety of the section C. R. A. keeping the control in his own hands, as above explained. There should be a normal method laid down for fighting each fort, but the fort commander should always be ready to change the "case" or mode of firing, whenever occasion demanded, and he should have a plan ready, in his

head, in case of breakdown in any part of his gear. As long as he is engaging one objective he can keep the complete control in his own hands, and it is evident, in such a case as B (2), when the ships cannot return his fire, he can give his whole attention to the waterway; in special cases, as when guns are mounted for high angle fire, and fought by a P.F. placed at a distance, he would even leave his men and go to the observing station. The officer responsible for the fire must see the waterway, *coûte que coûte*. But if a fort has to engage two objectives simultaneously, the fort commander can, himself, only direct the fire against one; he must give up the control of the guns engaging the other to some officer, who, in that case, will practically exercise the functions of a fort commander. Each objective engaged requires at least one range-finding instrument.

Under this heading of "Control of Guns," I wish to draw attention to the following points:

11. In many places elaborate measures for identification and indication of objectives are useless, if not mischievous.
12. In each locality a line of action should be sketched out for the section C.R.A. by superior authority.
13. Schemes of defense should be drawn up of a practical nature, so as to be useful to officers of the rank of fort commander, new to the locality; great advantages would accrue if there could be more collaboration between officers of the rank of section C.R.A. and C.R.E. and representatives of the Royal Navy, in these matters.

IV. THE PLACING OF GUNS.

The Site.—Efficient protection should always give way to efficient working; both are attainable when a high site is chosen. The higher the site, the more accurate the gun, the larger the virtual target, and less bad effect is caused by errors in range or elevation and mistakes of all sorts; deck attack is easier, range finding is more accurate, and a suitable place for the D.R.F. can usually be found. In fact, the ranging of guns, when no high ground is available, is a difficult matter, not only on account of the unsuitable station that must be given to the fort commander, but also because the special depression range-finder for low sites is unreliable, if not more than 30 or 40 ft. above the sea, unless it is kept in the most perfect adjustment and used for ranges not exceeding 2000 yds. It is to be hoped that the horizontal P.F. will get us out of what, at present, is a difficulty. In addition, with a high site, an attack cannot be pressed home, which, we are told, is considered by many sailors the proper way to deal with forts.

Q.F. guns should always be placed high for the following reasons: They have often to be fired at an unmeasured range; tangent elevation and a high site minimize the effects of errors in estimation; the method referred to as Colonel French's can be applied, and may solve a great difficulty. Shots from a Q.F. gun striking the deck of a torpedo-boat are apt to glance, and yet these craft offer an almost horizontal target; now the higher the site the less this liability will be. Mine-fields, booms, etc., are often protected by Q.F. guns on either flank; if the latter are placed near the sea level, as is sometimes advocated, accidents from cross fire may well occur,

which could be prevented were the guns higher up; at the sea level they would also be at a disadvantage, as compared with those on board-ship, whereas command would in many cases insure immunity, at all events, from short range fire. As their trajectory is flat, it is said that when placed low their fire will have a long dangerous zone; it must, however, be remembered that their axes will, as a rule, have to be at least 5 ft. above mean tide, and this, added to the curvature of the trajectory, small though it be, will tend to diminish the zone in question; in addition, all shots that do not hit the narrow freeboard or small conning tower of a torpedo-boat will probably glance.

Grouping Guns.—The guns of a fort should be collected into as few groups as possible, subject to the following conditions: all guns in a group should practically have the same field of fire; they should be of the same calibre and nature, they should not occupy a greater frontage than will admit of their being efficiently overlooked by the group officer, nor must this be of such a length that at extreme trainings there should be any serious difference of range between the flank guns of a group, all the guns of which are fired at the same range. This frontage should never exceed 40 yds. (see Fig. 3). It is also desirable that, when a group has fired its salvo, it should be possible to reload and lay, without the detachments being endangered by the fire of neighboring groups; at extreme trainings also, individual guns will interfere with each other; this matter should be carefully considered in designing the fort.

Q F. guns ought, as a rule, to be grouped clear of a fort; their commander practically exercises the function of a fort commander.

The points I wish to draw attention to under this heading of the "Placing of Guns," are:

14. The importance, in all cases, of a high site.

15. The necessity for greater attention to the requirements of group control in placing guns.

V. THE SELECTION OF GUNS AND MOUNTINGS.

Type of Gun.—Common shell being the normal projectile and shell power our principal means of offense, it appears to me that, with a certain sum of money to spend, there should be a very strong reason indeed for substituting a gun of weaker shell power, for an old type gun of greater shell power. It is, I believe, a fact that a 6-in. B.L. gun on a H.P. mounting costs the same as a 10-in. R.M.L. on a barbette, while the weight of their respective common shell bursting charges are as 1 : 3, giving the new gun the advantage of its cast steel shell. If, now a cast steel shell were made for the older gun, and seeing that effect of burst varies somewhere as the square of the weight of powder, surely, of the two, the 10 in. gun would be, by far, the most effective, if the two classes of mounting were both permissible for other causes. Moreover, there would be but little difference in the rate of fire.

Mounting.—With regard to mountings, they should be as simple as possible; a little weight or general unwieldiness may be forgiven as long as they can be worked by hand and do not require much supervision. On mo-

bilization, we shall have to depend on a good deal of untrained assistance. Our beautiful H.P. carriages I look on, as necessary evils, only to be resorted to from dire necessity.

Guns for High Angle Fire.—Likely anchorages for an enemy can most efficiently be defended by guns mounted out of sight, inland, worked by Case III, in connection with a well-advanced observing station. No vessels in existence could remain under an efficient fire of this kind for any length of time. In applying it, range presents little difficulty, but training has to be carefully considered, on account of the great effect of wind and drift. If dynamite guns can only be perfected, they seem to have, here, an ideal rôle.

Q.F. Guns.—In certain places, the newer type heavy Q.F. guns would constitute, of themselves, an efficient defense; they are simply medium ordnance superbly mounted. In addition to these, however, there has been a tendency of late to exalt the use of the lighter and mere auxiliary types, at the expense of the ordinary armament. No doubt, as weapons they are excellent, but where shall we get men to work them, especially in the early days of mobilization, without denuding the heavier guns of their detachments? In the hands of untrained men Q.F. guns are worse than useless. I am also of opinion that many of the objects they are supposed to fulfil, could be equally or better carried out by case or shrapnel. I do not believe in firing them into haze or smoke to "sweep" a waterway; there would be a certainty of great waste of ammunition and a probability of considerable danger. They have their place, no doubt, but should not supersede, to any great extent, the heavier guns; they should be on cone mountings and be fired from the shoulder; field carriages are unsuitable for coast work, and mobility would only be a source of confusion, especially at night. Coast artillery has no mobility, it must depend on its long arm and its heavy blow.

Case-shot Guns.—When it is required to cover with *mitraille*, the neighborhood of a boom, the opening of a harbor or a mine-field, close at hand, special guns, to fire case shot, are an efficient means of defense; if on opposite sides of an approach, they should be mounted with traversing stops to prevent any chance of their firing into each other. See Fig. 4.

The question of choice of guns is a large one, and, to a certain extent, outside the scope of this lecture, I, however, wish to draw attention to these essentially artillery aspects of it:

16. The desirability of heavy shells and simple mountings.

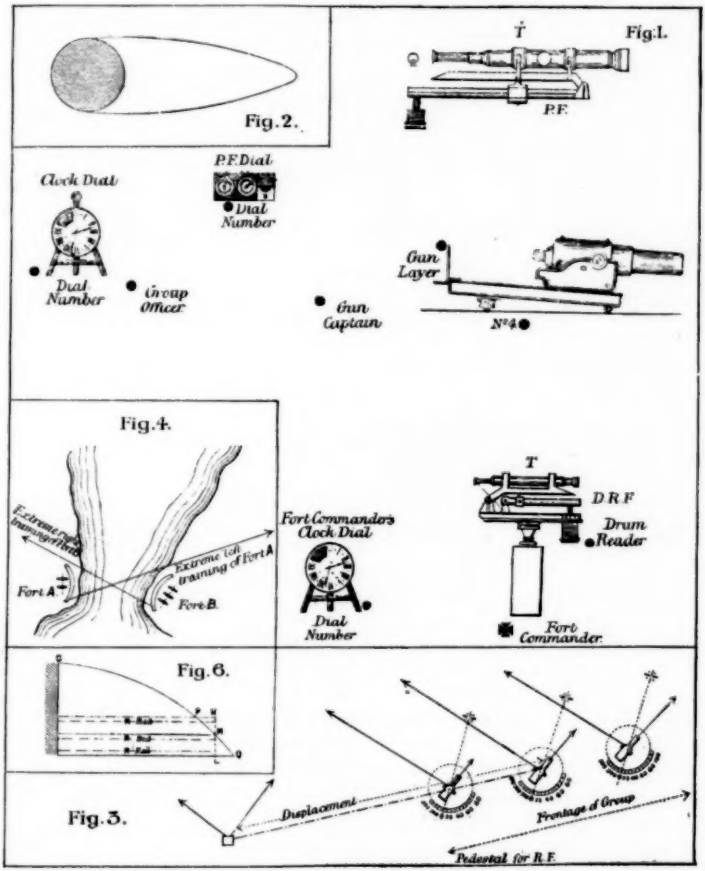
17. The difficulty of efficiently manning a great number of Q.F. guns and the possibility of the guns of the forts themselves performing many duties, apt to be assigned to the Q.F. guns.

18. The use of case-shot guns for protecting waters within short ranges.

VI. WHAT MAY BE EXPECTED FROM GUNS.

Possible Accuracy.—Gunnery in peace has the following advantages over gunnery in war:—The nerve strain of battle is absent; there are no casualties; there is no surprise; there is no fatigue; the work is seldom done in really bad weather, and scarcely ever at night; observation of fire is not interfered with by any confusion, as to where a certain shot comes from; the objective is never hidden by smoke, and, on account of the danger, practice

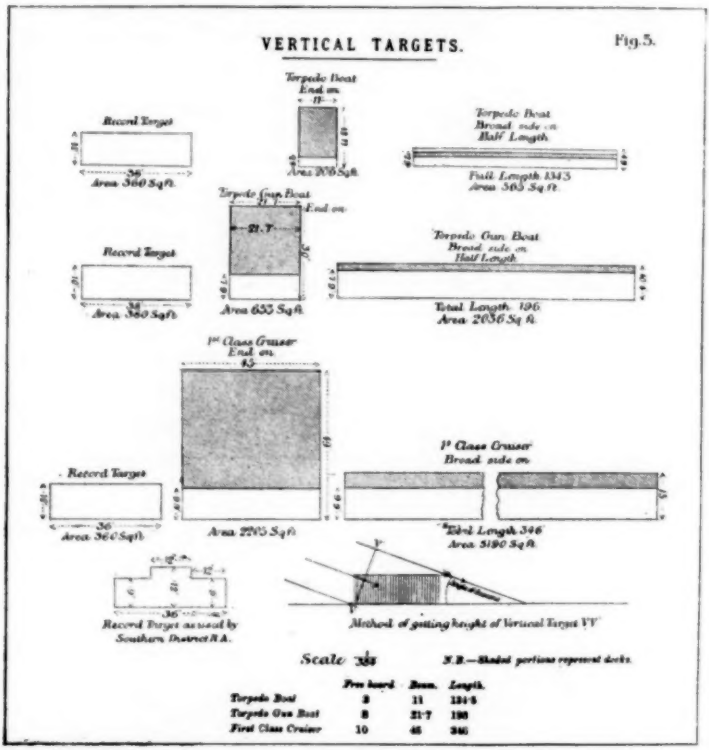
is never carried on, when fog and haze exist; ranges change so slowly, on account of the speed and direction of the target tugs, that the difficulties of corrections for travel, do not crop up and are not realized. On the other hand, as each round is so expensive and consequently so few are allowed, all firing has to be carefully used for instruction; detachments never fire a large number of shots under the same conditions; observers, gun layers,



methods of firing, etc., are continually being changed; the targets fired at are small as compared with ships, and real rapidity is interfered with, from safety considerations. While there is thus something to be said on both sides I think the great difference between peace and war should be fully realized, and I, for one, would be very loath to form in my own mind any

ambitious theory; at the same time, I feel that the power of the guns is apt to be underrated.

I have myself seen some excellent results at a Hong Kong target, going 8 or 9 knots, such as 20 rounds, fired from five guns in 7½ minutes, all falling inside a virtual target, 12 ft. high by 30 ft. broad; and last year the whole of the practice in the Isle of Wight, some 500 rounds—practice which was chiefly instructional, and sometimes carried out in a way that precluded accuracy for line—gave us one hit in every three rounds, on a target 12 ft. high by 31 ft. long. However some of these results come under the head


VERTICAL TARGETS.
Fig.5.
Torpedo Boat End on.
Record Target
Torpedo Boat Broad side on Half Length.
Area 206 Sq ft.
Full Length 134.5
Area 565 Sq ft.
Torpedo Gun Boat End on.
Record Target
Torpedo Gun Boat Broad side on Half Length.
Area 633 Sq ft.
Total Length 196
Area 2036 Sq ft.
1st Class Cruiser End on.
1st Class Cruiser Broad side on.
Record Target
Area 2295 Sq ft.
Total Length 346
Area 5190 Sq ft.
Record Target as used by Southern District R.A.
Method of getting height of Virtual Target VT
Scale
N.B.—Shaded portions represent decks.
Torpedo Boat 3 11 134·5
Torpedo Gun Boat 8 21·7 196
First Class Cruiser 10 46 346

of "calculated hits"; that is the line and the longitudinal error were observed, and the hit was determined by the known angle of descent. Discredit has sometimes been thrown on this manner of scoring, so I will put some results before you which were obtained on a record target, actual hits only being allowed to count. The target was 36 ft. long, 12 ft. high in the middle, and 9 ft. high for a distance of 12 ft. at each end. (See Fig 5.) It was so heavy that it had not a greater speed than 5 or 6 knots, and ranges changed but slowly, giving an average of 2200 yards. Against this target

six companies of the southern district carried out their competition practice, each company firing on a different day. They together furnished 6 fort commanders, 6 range-finding detachments, 22 group officers, 44 detachments, and consequently 44 gun captains and gun layers; of the last half were chosen by the officers commanding companies, and half were determined by lot from the registered layers of the companies. Each company fired 16 rounds from 4 guns; one weak company only furnished 4 detachments, so that each of these fired 4 rounds; but in the other cases group officers and detachments were changed after each had fired two rounds only; half the rounds were by single gun and half by group salvo.

The weather on the six days varied from windy and rainy days to almost perfect ones, and from those again to days on which there was a dazzling glare in the gun layers' eyes.

The firing took place from Sandown Fort, an old casemated work whose interior arrangements were very defective; the guns were 10-in. R.M.L., 30 ft. above the sea. Case II and D.R.F. were employed, the instrument being on the roof about 45 ft. above mean tide. Reduced charges were used, which, according to the range tables, reduced the accuracy very nearly 50 p.c.; at all events there was no doubt that the wind had considerable effect on the high trajectory. There was, occasionally, interference from smoke and fouling of ports, but the average of the actual times taken by each company was 12½ minutes. Of the 96 rounds fired, 44 were hits upon the target. For the sake of comparison I have put to scale on the figure (see Fig. 5), the virtual targets presented by this record target, and by a 1st class torpedo-boat, a torpedo-gunboat, and a cruiser taken from the *Naval Annual.*

Effect of Smoke.—A great deal has been said about the effect of smoke in obscuring a range: it is of course all a matter of wind, or rather the absence of wind; a gentle breeze blowing down the range is the most annoying; thus, one of the companies above referred to was stopped for 2½ minutes, owing to the slowly moving smoke drifting in the same direction as the target. But as far as this went there was only one bad day in the six; a high wind soon clears off the smoke. I have seen in so menight operations the effect of barrels of pitch being lighted on a ship's deck so as to enclose her in a veil of smoke; dense clouds rose up all round her, and though she was passing through an area illuminated by many thousands of candle power we could see absolutely nothing of her hull. We however knew her range, approximately, from her position in the channel, for now and again we could see shadowy lines which we knew to be her masts, and we could easily have fired on her with effect. I think the effect of smoke is apt to be exaggerated.

Under this heading of what we may expect from guns, I wish to draw attention to the following points:—

19. May we not now claim that in daylight with well trained men, actual hits on a target representing a ship should be numerous in view of the experience detailed above where many of the conditions were the reverse of favorable and the target so comparatively small?

20. Is it not now time to qualify that oft quoted and very sweeping dic-

tum that "for ships to run past forts where no obstacles exist, is a comparatively easy matter"?

VII. THE ACTION OF GUNS AT NIGHT.

Respectable opinions vary greatly as to what can and cannot be done by an enemy under cover of fog or darkness. It is, I fancy, very much a question of locality, and here the guidance of our naval *confrères* would be invaluable in drawing up schemes of defense; for the brain of an ordinary landsman reels in presence of the many *ex cathedra* statements that are made.

Electric Lights.—The question of electric lights is in an unsatisfactory state. There was a beautiful theoretical simplicity about our early idea of noting vessels as they passed through a fixed beam, and passing them on from light to light, the whole being controlled by the section C.R.A. This would be a patent method for rendering torpedo-boat attacks easy. The creation of a large and brilliantly illuminated area which was also tried, might work well if a very large number of pieces bear upon a narrow obligatory place of passage. It seems to me, however, impossible to make certain of stopping at night a swarm of torpedo-boats gallantly pressing home an attack by defenses at one portion only of a channel. Where the defenses have depth it is a different matter, the advanced guns putting those in rear on the *qui vive*. What amount of depth of defense will render a channel secure is, I fancy, at present doubtful; it would depend in a great measure on the answers to some of the questions already referred to. From what I have seen of night operations I am convinced that as a rule search lights are more convenient than fixed beams. Colonel Watkin's dials have given us an excellent means of controlling them from any station, but as a rule I should prefer to see them normally under the fort commanders, subject of course to any orders the section C.R.A. may give. We should, however, not leave the arrangements for electric lighting to be settled under the pressure of imminent war. It is no easy matter to place them safely to the best advantage, and the present uncertainty is a serious embarrassment to the preparation of practical schemes of defense. It is of course a matter of expense.

Electric lights might be supplemented by parachute lights, fired from mortars. Two or three specially constructed mortars of small weight placed at a fort commander's station might give him the means of keeping his front illuminated during the progress of a torpedo-boat attack. This could easily be determined by experiment.

Illuminated Sights.—This is also a pressing question; there are many technical reasons why Case II is better than Case I at night, so electric gun sights should be of the straight-edged pattern. A contrivance of this sort was unofficially tried, with success, at the Isle of Wight two years ago; there does not appear to be any difficulty about the matter.

An illuminated tangent sight is a necessity for Q.F. guns: we had a modification of the naval sight in use, but we found that it was impossible to lay, with a full sight, as by day. This is very important from our point of view, and a simple alteration was proposed by one of our assistant in-

structors, Sergeant Kirby, recommended and sent forward; I have not heard of it since. It would also be well if the elevating wheel of this sight could be manipulated by a man, other than the gun layer, so that the latter could keep his line, while the elevation was being altered, either by direction of the gun layer or the group officer or fort commander. It would also seem desirable to experiment with combined quadrant and tangent elevation, as before noted. On many nights in the year you can lay perfectly with electric sights, without search lights or other artificial illumination; on many occasions their absence renders the guns useless. It is a technical matter, and, in my opinion, they are a crying necessity.

Microphonic Detectors.—If these instruments can be perfected they would render the defense, by case-shot guns, an easy matter by night.

Identification of an Enemy and Rules of Traffic.—The measures to be taken at night, to distinguish between friend and foe, have, no doubt, been thought out for each locality. It would, however, be wise to familiarize officers with the procedure that will be in force in war, or, at all events, to let them think it over. At the present moment, the question "What am I to do if I see or hear a swift objective approaching?" would be a matter of considerable embarrassment to many fort commanders.

The points I wish to draw attention to under this heading of "Action of Guns at Night," are as follows:—

21. The necessity of the immediate placing of the E.L. question on a more stable basis, and of experimenting with parachute lights, etc.

22. The necessity of providing and practicing with electric sights.

23. The necessity of the junior ranks being accustomed to realize in peace the procedure that will be followed in war, as to the identification of approaching vessels.

VIII. REQUIREMENTS FOR TRAINING PERSONNEL.

Companies of Royal Artillery.—Individual training has its uses, but by far the most valuable kind is that, where officers and men work together in units. The late improvements in this respect are well known, as far as the Garrison Artillery is concerned; but it is very difficult to carry out efficient training with the present allowance of ammunition; there is, however, little likelihood of its being increased. The panacea is the establishment of practice batteries, so organized that 64 pr. projectiles can be fired by all the different methods and cases. But this must in no way interfere with familiarizing all hands with the forts themselves.

It is not the actual firing of a few guns in a fort of any size that effects this; a group of guns is practically the same thing, wherever it is placed; what really is of value, is the testing the communications and range finding arrangements of a work, and a very great deal can be done by manning, as for war, without actually expending ammunition. Testing of mountings and familiarizing men with them is fully met by "station practice," but the larger works, often from lack of men, often from barrack accommodation being mixed up with gun floors, have, in certain respects, to be neglected, with the result that no one knows how they should be fought.

Militia Artillery.—The training of the Artillery Militia has relatively

advanced *pari passu* with that of the regulars; they now settle down quickly into a fort, and usually do very good work; it is, however, often the case that in each brigade there are one or two officers, who seem to absorb the greater part of the good of the training, leaving a residue who do not attain to anything like the same efficiency. Now in a fighting force we want a good general average. It also is a pity that no means seem to exist, for keeping up the knowledge obtained, periodically; but, speaking generally, in the Militia, we have a magnificent reserve.

Volunteer Artillery.—The training of the Artillery Volunteers has not progressed as it might have, and this is certainly not the fault of the volunteer officers, who so freely give us their money, time, and intelligence. But there has been for this force, as far as I know, no training of the unit, which is the only real training for Coast Artillery. Some of the officers may have seen, as from a Pisgah, a land flowing with range and position finders, but the greater part of the force are still in the house of bondage, trying to make bricks without straw.

There is no doubt that officers of both Militia and Volunteer Artillery want more help in their training. The literature of a new subject is not always easily understood; the tools of the trade require to be handled, and, perhaps in the past, there has been a little over elaboration, so that many an anxious student has found himself in the position of the man of Ethiopia, who when asked by the Apostle "Understandest thou what thou readest?" replied "How can I, except some man should guide me?"

The points I wish to bring to your notice are—

24. The necessity for practice batteries.

25. The desirability of testing the communications and the handling of our larger works.

26. Facilities for militia officers to keep up their knowledge between trainings.

27. That the Volunteer Artillery, whom we shall have to depend on in the early and dangerous days of mobilization, should have more opportunities for practical training, and more ammunition to fire.

When the Council of this Institution did me the honor of asking me to read a paper on Coast Defense, I was very pleased to accept the invitation. Three years' experience of a practice camp has convinced me that the efficient service of the guns of a fortress is one which cherishes and produces the highest military qualities: smartness, coolness, self-reliance and discipline; and I find, in the subject of Coast Defense, much to admire, much to interest, and much to learn. Our present position is accurately represented by a clever little picture, by whom I know not, which was supposed to show the state of the field artillery. In it, a gunner stood firmly planted on the Rock of Progress, but his boots were still encumbered by the mud and slime of the Slough of Despond, out of which he had struggled. In the distance towered the Peak of Perfection, but his road, even to its base, was barred by a yawning chasm, the Abyss of Fads. Still the drawing was full of hope, for over this ugly gulf was thrown a strong plank of Common Sense.

OUR ART OF WAR AS "MADE IN GERMANY."

By T. MILLER MAGUIRE LL.D., Inns of Court Rifle Volunteers.

(*The United Service Magazine, London.*)

THE columns of several of the daily papers have recently been full of complaints that the choicest products of British forges and looms are being rapidly supplanted by inferior goods all made in Germany. Our politicians and colonists join in the chorus of dissatisfaction by declaring that no sooner do they develop a new sphere of influence, whether in Asia or in Africa, than wily traders from the banks of the Elbe and the Rhine intrude with their bad wares and their pushing energy. Carefully avoiding Greater Germany, under the very ægis of the Union Jack, they supplant our native merchants, and undersell our most celebrated manufactories. But the grievances of the mercantile victims of Teutonic craft and ability are small compared with the chagrin of British students of strategy and tactics, and the dismay of publishers who have invested capital in producing British treatises on any branch of military art.

We are overwhelmed with translations of the literary labors of German generals; our tables groan beneath the ponderous and dreadfully dull tomes of a generation of writers who seem to thrive on a knowledge of the minutest details of two campaigns—1866 and 1870-71—and of these only. The Official Account of the Franco-German War in disjointed parts has been for years a text-book for English military students instead of being a book of reference according to the original intention of its authors; every movement of the forces of Von Goeben and of the Grand Duke of Mecklenburg Schwerin and of Von Werder and their subordinates, day by day and hour by hour, has to be learned in minute detail with wearisome iteration by despairing British soldiers, to whom the very names of the Debschitzs and Barnekows, Schmelings and Tresckows, are synonymous with profitless and dreary toil.

Studies like these dwarf the intelligence of pupils, eliminate the element of imagination from learning, and quench the ardor of curiosity, and yet the authorities continue to insist on this exhausted and exhausting curriculum. Surely as much strategy could be learned from a campaign of Napoleon or from the wars of Marlborough; and surely the Germans themselves would be the first to prove that a course of elaborately dry journals of French operations would be an extraordinary method of cultivating among Germans a taste for military history.

It is absurd that British soldiers should be expected to become acquainted with every manœuvre of every German brigade on the Somme, on the Huisne, and on the Ognon, while absolutely ignorant of the leading events, even in outline, of our conquest of India, and perfectly at a loss as to how our numerous combined naval and military expeditions reached their objects, or of the conditions on which the permanence of the British Empire depends. I venture to say that books like the "Decisive Battles of India," Maurice's "Balance of Power in Europe," "The Rival Powers in Central Asia," Colomb's "Naval Defense," and well-written accounts of

our leading operations in Africa and in Afghanistan, would be of more practical utility to British officers than all German military history put together. Again, from the point of view of general culture it is clear that French military histories are far more readable, are clearer, brighter and produce more lasting effects on the minds of students than the labored efforts of the Teutons. In any case it is time, as Lord Wolseley recently said in Woolwich, that the leading naval and military race in the world, which has won the greatest empire by the sword, and whose requirements are very different from those of either Germany or France, should work on its own lines and cease to follow with servile adulation the victories of 1870-71.

There were brilliant leaders long before Von Alvensleben, Von der Tann and Voigts Rhetz. Without any desire to disparage these illustrious heroes, a Briton may be excused for pointing out that to us the topography of the country between the Hindu Koosh and Karachi is one of more importance than the location of a score of German corps, and that Bapaume and Montbeliard are to the dwellers by the Thames mere empty names as compared with Tel-el-Kebir, Dongola, Suakim and Kabul. The Canadian Pacific Railway concerns us much more nearly than the line of communication between Frouard and Blesme.

Before devoting particular attention to two prominent German mllitary treatises it is desirable to point out that there are still officers who think Hamley's "Operations of War," though written by an Englishman, as likely to interest and instruct his countrymen as any work by Rüstow or Goltz, and in "Fame's eternal bede roll" may even rank with Prince Kraft's "Letters on Strategy."

Colonel Hare, R. E., has translated Colonel Meckel's edition of General Bronsart von Schellendorff's "Duties of the General Staff." As this translation was issued by the Intelligence Division of the War Office quite recently, it is fitting that it should be the subject of a few remarks. To be candid there can be little doubt that, but for the German craze, Colonel Hare, and the other members of the Intelligence Division could have easily compiled a far more learned, more interesting and more profitable book for the use of British officers who are educated in Great Britain and Ireland, and who discharge their duties in Asia, Africa and America, and spend no small portion of their lives at sea.

Of course, we ought to use every good idea we can acquire from either friend or enemy, but we are neither soldiers nor subjects of the German Emperor. If all the parts of this book which do not now apply, and probably will never apply, to our people, military or civil, were cut out, its bulk would be considerably diminished. We have not even five army corps of regulars at present; we do not wish to have 500,000 regulars on duty in peace time. Our Reserves are not like German Reserves; our Volunteers are not like the Guard Landwehr.

I quite admit the great utility of the literature of foreign wars in its proper place, but it is clear that till we adopt conscription German military lore on a grand scale is of as little practical value to us as the tactics of Vegetius, and not as entertaining an exercise of memory and judgment. The orders and plans which might be very useful on the banks of the Mo-

selle would be out of place on the banks of the Indus. Indeed Bronsart himself says, "the arrangements of the French, which were practical enough in Algeria, completely broke down in the war with Germany." Moreover, to quote our authority again, the political organization of our country makes German ideas impossible in their application; it would be another matter if there were no longer such a condition of things as, for example, "the perfectly distinct and peculiar organization of the English War Office." To Englishmen at present some of the discussions in Part II. are of merely academic value, of purely as abstract a nature as astronomical disquisitions, interesting and romantic but outside the range of practical life in this every-day world. While looking at the stars we may tumble into a ditch; and while lost in wonder at how to move most effectively from Strasburg, Mayence and Metz towards Paris with many divisions of cavalry and armies consisting each of from three to eight corps, we may forget how to handle a few battalions in the passes of the Suleiman Range or in the deserts of Upper Egypt.

One sentence on page 219, which is the basis of a long investigation, would have caused me to close the book were it not we are under the stern behests of historic orders "all made in Germany." This is the sentence: "We have next to consider the principles which should be borne in mind in the formation and composition of a large army. The formation of small armies (like the English) need not be considered, for in undertakings of importance they are usually united to larger armies, and thus it is only desirable that their *ordre de bataille* should facilitate this union."

The author of the "Duties of the General Staff" then goes on to say: "The forces in the field of a great military power are formed into several subdivisions which are styled armies," and he deals very ably with the necessary consequences of this preliminary condition. But where are these British armies to be found? they are not in any part of Her Majesty's dominions; our tactical books and our weapons may be made by German scholars and artisans, but the time has passed when our statesmen could call upon peasants from the Main or the Weser to fill our battalions. If Colonel Hare's German authority be correct we have no army at all, and therefore there was little necessity for rendering all this knowledge into English, a language not yet spoken by a "nation of soldiers."

It has been my painful duty for years with "many a weary step and many a groan" to follow in the footsteps of Bavarian and Westphalian, and Baden troops from the Saar to the Loire, and from the Ill to the Doubs, and to detail the daily marches of every Brandenburg and Saxon brigade in its pilgrimage from Berlin to Le Mans, or from Dresden to Paris, but I must confess that I cannot see how all this waste of effort in the least conduces to solve the problems now awaiting us in several distant parts of our empire. Where are our reserves of Landwehr to occupy the Lower Nile while our leading troops go up the river? Where is our screen of six independent cavalry divisions to show the Dervishes how there is such a thing as the "Fog of War"? All knowledge is useful, but it should be "worn with a difference"; the conditions of our own empire and the resources at our disposal, the topography of countries in which we

must fight, and how to carry troops over the sea are of more immediate value to us than all the volumes issued by all the military staffs of the Continent about the mobilization of their hordes of warriors.

Bronsart, page 313, after stating that German railways conveyed to the frontier up to August 9th 16,000 officers, 440,000 men, 135,000 horses, and 14,000 guns and carriages, goes on: "We may reasonably assume then that in future our performances under this head will not be behind these." The most captious admiral who ever attended the meetings of the United Service Institute would admit that the English would decidedly require an "Army as well as a Navy" if we are to expect not to come very far behind this performance in our immediate future.

Nothing can better illustrate the essential difference between our army and the German forces than the fact that this official text-book, an epitome of the best work of the "Brain of the Army," dismisses the subject of steamboats and transport of troops by sea in about six pages, 319-320, and 358-363. Manifestly this amount of information would not carry an insular power very far, yet the conveyance of troops by water to and from our isles is the very essence of the whole art of war as applied to the United Kingdom. How this can be done by us, or how our enemies can thus reach us, is of more vital importance to British politicians and soldiers than the tactics of every fight in which German armies were engaged since the days of Arminius.

To Von Schellendorff of course, as no question of any Teutonic landing in Delagoa Bay had arisen in 1884, sea power was a matter of comparative indifference, and he very wisely ignored it, but to the British people and to our military leaders it is the principal consideration, whether we are on the defensive or the offensive, whether we fight on land or on sea.

The strategy of this work (Chapter III.) is very well worthy of study, of course, but again we must remember that the predominant idea in the author's mind is set forth on page 357, "movement of troops on an enormous scale," under the conditions prevailing on a frontier like that of Germany on the west or on the east. It may be safely said that any struggle in which the Britons of this generation can engage would in no wise resemble the problems which occupy the first places in the minds of continental strategists, and again I repeat that it is quite time that our soldiers and civilians relegated the study of the Franco-German War to its proper position, as an interesting and very important incident of the past, like the campaign of Jena, but not more instructive to us than the campaigns of Marlborough, or Jackson and Lee, and that we devoted the time now utterly wasted on trivial and petty details of dozens of engagements between foreign races to the contemplation of our own past history, and to preparation for our future destinies.

Some distinguished officers who have passed through the Staff College were a few weeks ago talking about these topics in my presence, and some of them did not hesitate to allege that the reason why we were "cabined, cribbed, and confined" within the narrow bounds of 1870-71 was because the examiners knew no other campaigns, and did not dare to set papers on either the operations of Napoleon or the American Civil War, or on the

campaigns of our own army. This explanation does not satisfy me; I believe the examiner's conduct is due to deference to a fashion or craze; no particular examiner likes to begin an innovation. But let none hesitate; the reaction is now pronounced, and before long a lecturer on any part of these overdone battles will be shunned as a persistent bore. If we must learn from foreigners, by way of a change of authors I venture to suggest that any student will learn more in a shorter time about the modern art of war from either Lewal, or Derrecagaix, or Pierron, than from Goitz or Blume. If we must have foreign authorities, the Frenchmen are far more readable. Much as we may dislike French policy, and for very sound reasons, we must admit the perfect lucidity of French historic literature; it produces impressions, not blurs, on our memories.

The text of the German Official Account has been forced upon all military students in England in deference to the fashion of the hour, which excludes everything English from the studies of Englishmen, and worships everything foreign, however unsuitable, though Von Moltke himself said, "I admit that it is far too full of detail for the general (German) reader, and far too technical." Yet this is the work which we have been obliged to learn word for word during these dreary years, and during this time no reference whatever has been made to any military or naval exploit of the British race. Nor are things much better now; the present text-book for entrance to the Staff College is Von Moltke's Franco-German War, translated by Forbes. I have the utmost admiration for the splendid organizer of German victory, but I agree with him that in his later years he had no particular aptitude for military narration. While writing these lines I see on the table his early work on the state of Turkey. What a contrast in his declining years! It would have been much better for English readers if Mr. Archibald Forbes had written a general description of the war on his own initiative rather than have translated Von Moltke's book. This tires to the last degree people who are already familiar with the original official account, and it discourages and depresses a young student of the military art; it is quite devoid of eloquence or any other human interest; though dwelling on a mighty struggle which decided the fate of nations, it is as prosy as any ordinary statistical essay. Mr. Archibald Forbes from his own standpoint would have written something to be perused with eagerness, not a mere dry-as-dust record of tiresome facts.

The vanity of all attempts to apply German notions to British practice is recognized by every one except our own faddists, and by none more clearly than by Germans themselves; for example, on Bronsart's, page 513 we find this pregnant sentence: "It should never be forgotten that the demands we are accustomed to make on our own troops would, if transferred to the condition of other armies, be probably impracticable, and that the military institutions, etc., of a nation must always be made to suit the peculiar condition of the country and character of the people." And thus we find that in Germany military cadets are expected to know above all things the history and literature of their own land, while in our civil and military schools everything pertaining to the history and literature of our nation is either slighted or ignored. I was very glad to listen to the indignant

words of Lord Wolseley on this topic before the Volunteers early in March, and the manner in which he contrasted the cultivation of patriotism in the United States with the preposterous ignorance of the progress of our Empire that prevails in so-called seats of learning. This ignorance is absolutely nurtured and sedulously maintained by the programmes of education at public schools, in Woolwich, in Sandhurst, for Militia officers and for the Staff College. From a national point of view, and from the point of view of general intelligence, all this German craze is most deplorable. From the practical soldier's point of view I venture to maintain that a study of any one of our recent campaigns against uncivilized peoples, would be more useful to our officers on the Nile than the exact state of affairs on the Lisaine at 3 P. M. January 16th, 1871, or how the 1st Bavarian corps dealt with La Motte Rouge. I think the officers of the Connaught Rangers would bless Captain Callwell's "Lessons from Small Wars" more than General Degenfeld's "Orders at Frahier and Chenebier" for practical hints as to how to operate against the Mahdi, and the volume of Maurice about Egypt would be at least as serviceable as the pages of Hoenig. For my own part I should welcome with joy the assurance that this generation of Britons was never to hear anything further about either the left, right or centre of the battle of Gravelotte; I cannot care how many German warriors hid themselves in the folds of the ground at that engagement, or how many were huddled together on the Mance bridge, or what might have taken place if the whole of that battle had been fought in quite a different fashion by every man engaged on each side. Possibly the result might have also been very different. I am content to know that, as far as we can now learn, no English regiment with all its faults could have done much worse than some of the best battalions on both sides, and that the less said about the glory or consummate genius of either side the better for the reputation of its nation.

The Anglo-German school fears an invasion of England, and yet goes on translating and editing elaborate instructions for campaigning, not in England, but in territories in which the conditions of soldiering are very different. On this point I hold that a volunteer at any rate would learn very much more in a much shorter time from Colonel Clayton's suggestion in the January number of this Magazine, than from the most accurate description of the operations at Beaune la Rolande, and he would gain much more by a handy book to teach the tactical working of troops in a typical English county, say Kent, in summer and in winter than from inquiries into the proportion of skulkers to fighters in August, 1870; this book might be supplemented by a smaller treatise describing how to defend any parts of England that resemble the manœuvring grounds of France and Germany; here of course the Franco-German tactics would be useful illustrations to some extent.

After being satiated with fulsome flattery of the German staff and of German generals and German courage for so many years, it is with a grim satisfaction that we learn on the authority of the last "up to date" research that in point of fact the assailing battalions in August, 1870, frequently retired after an amount of loss that would not have shaken the least hardened

soldiers of Cumberland or Wellington. If we have not appreciated the vital lessons, as far as we are concerned, of the German invasion of France by this time, nothing can teach us, and after all they only amount to the absolute necessity for making ready for war in time of peace, and for such a system of organization as will enable us to fight with effect when war comes. This lesson was preached long ago by Romans, and is to be found in the eloquent sentences of Bacon's Essay on "The True Greatness of Kingdoms and States." But then Bacon was only a Briton.

Notwithstanding all our raptures about German corps and German mobilization, our army is still composed of various ingredients certainly not made in Germany and not even guaranteed by a German trade-mark. Indeed we have recently been led to believe by the Anglo-Teutonic school of writers that our military forces are at present absolutely useless. This I cannot for a moment believe; some of our foreign friends have seemed very ready to test it for us, and, if they believed all that some English writers say, they should not hesitate to prove its worth forthwith. While I quite admit that much more ought to be done for the army, I believe it will be done far better and much quicker by devising military systems and methods of our own, rather than by servile imitation at a long distance of our neighbors, who would never have devised their present methods if they were situated as we are. Would Von der Goltz have written his work, would any German pay the least attention to his theories if, instead of Alsace and Lorraine, a good stretch of deep and dangerous sea were between the Saar and the Meuse?

It will be a good day for our people when our military experts can spare some time from studies of Hoenig to a thorough organization of our own forces, not for the conquest of either France or Germany, but for preserving every part of our vast dominions wherever situated against hostile attack, and for rendering surprise by any invader out of the question. We could do all this when Napoleon was in command of even greater relative forces than either Germany or France now has, and when he could easily crush any two Continental powers. To the writers whose only text-book is a German official account of 1870-71, a quotation from Napier may seem a ridiculous reproduction of obsolete ideas; but long before the genius of Von Moltke had humiliated France these words were true:—

"Very subject to false impressions are the English; and, being proud of their credulity, as if it were a virtue, they cling to error with a tenacity proportioned to its grossness. An ignorant contempt for the soldiery was prevalent long before the ill-success in 1794 and 1799 seemed to justify public prejudice; the cause of those failures was not traced; the excellent system introduced by the Duke of York was disregarded, and England at home and abroad, was, in 1808, scorned as a military power, when she possessed, without a frontier swallowing armies in its fortresses, at least two hundred thousand soldiers, the best disciplined, and best equipped in the universe, together with an immense recruiting establishment, and the power of drawing, through the militia, without limit on the population. Many were necessarily employed in defense of the colonies, yet enough remained to furnish a force greater than Napoleon had at Austerlitz, double that with

which he conquered Italy. In material resources, also the superiority of English mechanical skill was shown, and that intellectual power which, in science, arts and literature, is nationally conspicuous, was not wanting to her generals in war."*

The more we reflect on the wisdom of our ancestors the less we shall fear the devices of our rivals. Though I referred to translations from Hoenig as being not more useful to us than the records of the march to Kandahar, or the story of the first Kaffir war, or the first march of Kumassi, it is delightful to read his satires on his own countrymen and his withering scorn for their supposed prowess, about which we have been bored to excess for twenty years. The dream of our cavalry was that they might be translated into "the ubiquitous Uhlan." Is the lance necessary? "For reconnaissance," says Hoenig "it is an encumbrance, nor does experience in war show that in any other respect it is superior to the sword." What will our new cavalry leaders say to all this? I just quote one sentence from Colonel Hare's review of Hoenig's Tactics in the March number of the *Journal of the United Service Institute:*

"It will be seen that Hoenig is anything but a believer in the ubiquitous Uhlan, about whom so much nonsense has been written and said in this country and in France. That he proved himself a typical scouting cavalry soldier in the war of 1870-71 is *absurd*, and directly the country became intricate and the inhabitants hostile, he *was a failure*. Armed with a clumsy lance, an obsolete pistol, and a heavy sword, he was *an easy pot-shot* for the *franc tireur*, and was useless as a scout." As the author says, "The presence of the enemy was only known in the fighting on the Loire, when infantry and artillery became engaged in earnest. We know indeed that the German Uhlans very soon armed themselves with captured Chassepots, and thus became an *inferior mounted infantry*." Verily a "Daniel come to judgment."

The italics are mine, but it is obvious no critic in the *Times* has ventured to handle our own native horsemen more severely than this German has handled the very pick of the chivalry of the Fatherland. Let us take courage. Perhaps our own dragoons and lancers, and our simple hussars are not relatively so very useless and inefficient, if all were known.

But surely the present regulations of the German army are the perfection of the military art! at any rate, we are never allowed to forget them. But what says Hoenig? If he be right we should have been much better employed in devising regulations of our own to suit the British Empire rather than in copying out the edicts of continental headquarters.

"The present regulations of the German army," he adds, "which have swept away so many traditions of the past, are the direct outcome of experience in war; but seeing what we must now expect from smokeless powder, small-bore rifles, and the destructive effects of modern artillery projectiles, they are anything but satisfactory."

But I find that I have exceeded my space, and I reserve Prince Kraft's Letters on Strategy as based on Bronsart von Schellendorff's chapters for another article. For the present, I trust that I have said enough to show

* Napier, "Peninsular War," vol. i., p. 7.

that it is time to reflect on the opinion now very prevalent among both soldiers and civilians, that our art of war as "made in Germany," should soon be superseded by a home-made commodity.

A GERMAN VIEW OF THE COSSACK "LAVA."*

Translated from the *Russki Invalid* by LIEUTENANT R. G. BURTON, 1st Infantry, Hyderabad Contingent.

(*Journal of the United Service Institution of India.*)

IN view of the articles which have lately appeared in the *Journal of the U. S. Institution* the following remarks, translated from the *Russki Invalid* of the 21st April, 1894, may be of some interest.

The *Russki Invalid* says:

Two years ago the articles of M. Mitkevich on the Cossack Lava appeared in the *Military Magazine*, and attracted general attention in military circles. In these articles was explained the point of view from which we must regard our Cossack cavalry, and attention was drawn to the incorrectness of the opinion that the Cossacks are a bad imitation of the regular cavalry. On the foundation of historical data and logical deductions the author arrived at the conclusion that the Cossacks should be regarded as natural cavalry, having their own history, traditions, original military organization, and a whole array of moral and material data which demand a special system of engaging the adversary, quite distinct from that adopted by regular cavalry. According to this the fighting system of the Cossacks leads to their traditional Lava which presents an incarnation in a national Russian form of the idea of the tactics of the Mongol Tartar horse. Such a presentation of the question of the Cossack Lava produced a deep impression not only among us in Russia but in other countries. In Germany, Austria and France, the military press considered the question, attempting to explain the importance of Cossack tactics in the future rôle of Cossacks in war. Some lengthy articles from the pen of the well-known German military writer, Von Dregalski, appeared in the *Neue Militärische Blätter* and we now propose to acquaint our readers with the opinions of the author.

From the appearance of Mitkevich's articles up to the present time his opinions have been contested only by M. Markoff, author of the well-known History of Cavalry, who expressed the opinion that the Lava can have no military importance, unless the mounting of the Cossacks be improved, and that a good horse is the principal, if not natural condition of success in the fighting operations of cavalry. M. Mitkevich replied to this, that, although good horses are of great importance for cavalry, the principal factor in war is always man and his action.

On the ground of this literary discussion Dregalski has also written his

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*See JOURNAL OF THE MILITARY SERVICE INSTITUTION for July, 1892, p. 808.

articles, taking his stand unconditionally on the side of the defender of Cossack tactics.

"For the attentive reader," writes Von Dregalski, "further explanations are scarcely necessary in order to acknowledge that M. Markoff arrives at incorrect conclusions. For this reason that M. Mitkevich (like M. Markoff) confesses that the mounting of the Cossacks is not good, and not equal to the requirements of regular cavalry, he would wish to preserve or rather return to the Cossacks the form of action which would make up for these defects compared with regular cavalry, and would give them the opportunity of gaining the advantage from their superiority in single combat." "The worse the Cossack horses are," says Mitkevich, "the more apparent is the necessity for the Cossacks to adopt the Lava against regular cavalry."

Omitting further repetition by Dregalski of the arguments of Mitkevich in favor of the Lava, we will go straight to the opinion of the German author as to the importance of that formation.

"Such is the difference of opinion," says Dregalsksi, "between the opposer and the defender of the Lava, which we have detailed because it has for the western neighbors of Russia not merely a theoretical, but a real importance, and, taking into consideration the peculiarity of Russian conditions, we must unconditionally stand in the camp of the defenders of the Lava. We consider the use of the Cossacks in this manner in a future war between Russia and her neighbors the more dangerous for the latter, because the Russian Empire has at its disposal, besides all its innumerable Cossacks, an effective cavalry, trained in accordance with new requirements. Whatever may be thought of the future conduct of the Cossacks, who now take part in warlike operations from the very commencement, they form a most important support to the regular cavalry, which fact more than all makes us reflect that we have nothing of the kind with which to oppose them. Our splendid cavalry need perhaps not fear the Russian dragoons, notwithstanding their possible superiority in numbers. It would not be less astonishing if our splendid horses and riders armed with lances could not hold their own against a considerably superior force of Cossacks, if these latter were to act in close order.

"We would even desire the latter, because this is a question of quality and the balance is in our favor. But if we consider ourselves as acting against an equal number of Russian regular cavalry, for instance against a division in which besides 18 squadrons of dragoons there are six, and perhaps more, Cossack sotnias, then success would seem doubtful for us. The Cossacks, acting in Lava formation and assisted by their fire-arms, could cause serious loss to their adversaries accustomed only to close formation, and taking advantage of the ground, could cause considerable disorder before the regulars could undertake anything. Success could scarcely be expected from attacking the Lava with separate units in close order, the blows would be delivered into space, and the adversary would soon appear in another place. On the other hand, the close order formations of the adversary would in such cases obtain some success. The use against the harassing Cossacks of scattered attacks of separate troops or even whole

squadrons presents only a temporary method of improving the position. Fire with case shot would be useful, but the adversary also has like weapons, and the Cossack artillery, as is well known, is excellent. The Cossacks could carry on this game longer, in view of the ignorance of our cavalry as to Asiatic methods of action and single combat, notwithstanding our undoubtedly better horses. Besides this the adversary would have increased chances of success with his regular cavalry. The latter would be the better able to choose favorable moments, and, under cover of the Cossacks, would be in less danger in case of an unsuccessful attack.

"Thus if the Lava form of attack is given a broad adaptation in this manner, there will be nothing for it but to teach our cavalry to fight in open order and fire from horseback. Improvisations at the last moment would be of no avail. The brilliant French cavalry attempted this in the retreat of 1812 in fighting with the Cossacks, who were aided, it is true, by the unfavorable condition of their adversaries as regarded supplies, and the cold weather. But on the other hand it is clear that if the Cossacks, who were then collected in large numbers, had performed their duty thoroughly, not a single soldier of the French army would have recrossed the frontier. The question remains open: do the Cossacks know how to do more now? However it is always well not to despise one's enemy.

"Such, founded on a careful study of the question, is our opinion of the Cossack Lava, which is still in embryo, but may have a great future. It would be most desirable if, in order to develop these thoughts, some competent authorities would state their ideas, and point out some means of action against the Lava. People have often inquired in what way is the action of Russian cavalry distinguished from that of ours? The only peculiarity consists in the effectiveness of the Cossacks and in their original action."

From this opinion of one of the prominent German writers the reader can see the great importance which is attached to the action of the Cossack Lava. Whoever has studied German military literature can easily be convinced of the self-confidence with which it treats of future collisions in war. This same Von Dregalski last year wrote that one Prussian squadron could easily drive from the field of battle 3 or 4 Cossack sotnias in close order. When the question of the Lava is raised we see the great perplexity of the same author, apparently realizing the difficult position in which the splendid Prussian cavalry would find itself in case of an encounter with Cossacks acting in the Lava formation. In close order, where the quality of the horse is the first essential, the Cossack would, generally speaking, not show to advantage. On the other hand, in the Lava, where the man is the primary element of success, Cossacks would have every opportunity of displaying their inimitable fighting qualities.

"Oh wad some power the giftie gie us,
To see oursels as others see us!
It wad frae monie a blunder free us,
And foolish notion."

THE AMERICAN LAND FORCES.

By M. REES DAVIES.

(*The United Service Magazine, London.*)

WHEN the present writer prepared for the *United Service Magazine* his paper on the American Navy (see issue for January last), there was no thought in any Englishman's mind of a possible conflict between us and our friends on the other side; and therefore no comparison was drawn between our naval resources and theirs. The period intervening between then and now has witnessed a change in the position. Happily, however, the little storm occasioned on both sides of the Atlantic by President Cleveland's message has blown over, and the Venezuelan boundary question, which gave rise to it, is—as it should be—in a fair way towards a peaceful settlement. However desirous they may be of seeing and taking part in some really active service, probably no British naval or military officers desire a war with America. After all, kinship counts for something; and if it is this very kinship that induces much rivalry and (no doubt) not a little jealousy in the commercial and diplomatic relations of the two, the spirit is not of the kind that ought to find its proper and final solution in the cutting of one another's throats. Besides, the cause is altogether too trumpery to be accepted as an adequate reason for a war from which, whatever the outcome, America would not recover for a generation or more. From the American point of view the Monroe doctrine is a reasonable doctrine enough. The nations may refuse to accept it as part and parcel of the body of international law; but in their relations with the United States they will be compelled to reckon with it.

The American people are brave and will sacrifice much for their principles and their rights. On the other hand, they are too shrewd to fight without very good cause; and though there is, and always will be, a certain party desirous of having English blood, it is indisputable that the bulk of those who shouted for war without knowing very clearly what they were shouting for, are now maintaining that silence which, in these circumstances, is golden.

The question at issue remains yet for settlement, but there is every reason to believe that such settlement will be peaceful. We do not care to believe that the Americans will enter light-heartedly into what must prove to be the most fatuous war of the century just to oblige the Venezuelans—for the cherished Monroe doctrine has no real bearing upon this question. For all these reasons it is not proposed here to draw a comparison between the relative fighting strength of this country and of the United States. It will, however, be obvious to all who know anything of this matter that, numerically, the resources of America are very insignificant. The Navy, for instance, does not exceed sixty vessels all told; and out of this total, as

may be seen by a glance at the list on pages 338–41 of the January number of this magazine, only one-half are fit for real service against European men-of-war.

The inevitable division of its present naval forces would make America utterly powerless to repel an invasion of any serious dimensions. The Navy Department at Washington is proceeding energetically with the task of building up a navy which shall be worthy of the nation; but it takes many years to execute an order of this magnitude, and in a discussion of the situation in the year of grace 1896, it could serve no good purpose to speculate upon what the provision may be, say, in 1926. It may be granted willingly that the best of the American vessels of war are really admirable fighting machines, and worthy of being placed side by side with some of the best that Europe can show. It may further be admitted that the personnel of the navy is capable, fearless, reliable, determined, and all the rest of it. Having in mind the close blood relationship of the two nations, it would not be creditable to England if it were otherwise. But these qualities are not, we think, wanting in Europe. The good American has not the least doubt in the world of his ability to whop any two Europeans. But this is a belief which he shares with others, and it has yet to be put to the test. Even if it be assumed, for the sake of argument, that the American *is* as good as two effete Europeans, still his chances of prevailing are remote, because the European Power—not necessarily England—could easily send against him more than twice the number of ships he himself could put out. And it is doubtful if, without volunteers, America could in a sudden emergency find men enough to equip all the ships she possesses.

Yet the main reliance of the United States in case of invasion would obviously be placed upon its navy. Suppose the war vessels to have been destroyed and the coast defenses (of which we propose to speak presently) to have proved inadequate to prevent a landing, what is the strength of the opposing land force? True, the landing is a sufficiently remote contingency, but it is possible under readily conceivable conditions, and this aspect is worthy of regard. The maximum regular force permitted by law is only 25,000, and as we were told at the time of the excitement following upon President Cleveland's message that there was to be no more recruiting, we may assume that the standing army does actually consist of 25,000 men, though it is beyond doubt that only a couple of months before, the total number of men enrolled was considerably under the maximum. The men are, moreover, scattered all over the country, some of them at very isolated stations, and in this way the whole force is cut up into parts hardly large enough to make a respectable village settlement. They have not yet been entirely equipped with the new rifle recently adopted. The supply of ammunition is admittedly sufficient only for the demands of peace. An effort has of late been made to keep a reserve quantity on hand, and though one does not know how far this most praiseworthy effort has been successful, it is thought probable by military experts in America that the plants in Delaware and California are equal to the supply of all the ammunition required for active service.

On the other hand, the army is in great want of what may be styled in-

cidental equipment. It has, for example, no intrenching tools, and there are barely sufficient supplies, camp equipment, tentage, etc., etc., to meet the needs of the present small force on a peace footing. Again, to turn to the supplementary forces, it is reluctantly acknowledged that there is no provision made for the accommodation, and little for the equipment, of the National Guard, still less of the 9,945,043 citizens who are liable in an emergency, and who "can be mustered into some sort of an organization" in that same emergency. At this present moment, there are no means of providing for the immediate necessities of the regular force, for under the rigid system of economy which Congress has imposed upon the executive branches of the Government, as few supplies as possible are kept on hand. They could no doubt be obtained, but not readily, and they would cost the country, if purchased in a hurry, an enormous sum of money. We might even have one of those amiable "combines," which flourish nowhere so well as on American soil, making a corner in the commodities or the raw materials, and charging double famine prices for them. We have been assured that the American army is "well organized, splendidly disciplined, carefully drilled, intelligently officered, and admirably manned." Let us accept all these well-distributed epithets without demur. On the score of training, intelligence, and courage, no nation in the world can cast reproaches on the Americans. The American army—and the large army of volunteers—have shown before this that they are not wanting in the qualities that lead to victory in war. But even the glamour of all the fine phrases quoted, cannot blind us to the fact that the American army is small. The policy which dictated this outcome, is sensible and reasonable enough so long as the United States, taking advantage of her isolation and her want of interest in most of the questions that concern Europe, refrains from meddling. Nominally, it is a strong point of American polity that only American affairs concern Americans, and down to very recent years this principle was very jealously and very literally interpreted. It is, however, capable of liberal interpretation; and although the solid "horse sense" of the gentlemen who have successively been at the head of the executive has prevailed to prevent mischief, there is a growing tendency to interfere in other people's affairs on the slightest provocation, and even on no provocation; and the luck of the American people, in getting out of scrapes of their own making, has come to be embodied in the saying, that "Providence is on the side of fools and the United States." The desire to be heard may be carried too far, and the war party being large, it only needs a President wanting in levelheadedness to precipitate the country into a conflict which would be a costly experience for both the parties concerned. Its sons would give a good account of themselves. But the qualities which distinguish Americans are not (one may hope) peculiar to them alone. More than one European nation has actually displayed them on the field of battle, and has shown itself to be actually possessed of the merits which we have assumed in the case of the Americans. When men, possessed of much the same martial qualities, are unevenly matched in point of number, it is not the weaker side that prevails. Having regard to the force that might be sent against it, even by a second-rate European

Power, it seems a natural inference that the existing army of America is too small to undertake a land war, even for defensive purposes.

In the event of war America must depend for any augmentation of its military forces upon the State Militia. There are only three States which can pretend to anything like a reasonably sized militia. New York has 15,000 men; Georgia 12,000; and Pennsylvania 10,300. Reference to official reports shows us, we are told, that beyond an assumed numerical strength "the State troops cannot be relied upon for practical help in time of trouble." The total volunteer force in the National Guard is put at 114,146 men. In addition there is, scattered over the various States and Territories, a force liable to duty of 9,945,043 men. How is this last group to be equipped, how gathered and how controlled? Again comes the reluctant admission that there are no means of supplying such an army with requisites of war, or of concentrating it under a general command. We take no notice of that "spread eagle" offer of 100,000 men by the Irish National Alliance. It must surprise many good Americans themselves to learn that camps of instruction for the militia are held in but thirty out of the fifty States and Territories. System is entirely lacking in spite of the perfunctory attempt of the general government to aid the development of the militia in a small way by contributing arms and equipment, and by sending officers as inspectors of the summer encampments. And not only is a uniform system wanting, but there is surprising diversity of opinion among the regiments, and even among individual companies, of a single State. Above all proper equipment is lacking. It is questionable if any one of them could put a fighting force into the field—to say nothing of an augmented force—with anything approaching a proper equipment. The New York troops have obsolete Remington rifles and carbines of .50 calibre. The Massachusetts troops have Springfield rifles of .45 calibre and of the 1873 and 1874 models. In Illinois there is no ammunition for field use, and the rifles are of .45 and .50 calibre. The Georgia and Maryland troops have old arms and not enough even of them. In Florida the Gatling guns do not work, and some of them are unsafe; while the Springfield rifles of two different calibres, have recently been reported to the authorities at Washington as being "in poor condition from lack of care." The powder supply, moreover, is "totally inadequate," and there are no mess outfits. In Connecticut the militia are in exactly the same case; so, too, are the men in Colorado and Alabama. From this last State the report says that "the powder is of an inferior grade and the arms woefully neglected." In California one-half of the rifles used are unserviceable, most of them being of the old model of 1873, and much worn and broken into the bargain. Pennsylvania, which is as well equipped as any State, is not exempt from the failures of other militia bodies; and the Philadelphia City Troop is armed with Winchester carbines of .44 calibre; and the Sheridan Troop and the Governor's Troop with Springfield carbines of .45 calibre. We might go on with this dismal chronicle, but is it really worth while? We have said enough to show that, if it is called upon to do so, this volunteer force must go into the field practically unarmed and unprovided with the means of subsistence. The work of furnishing it with all the necessities of war, suit-

able rifles and a common ammunition, would be tremendous if not (unless time be given) altogether an impossibility. Obviously such variety of armament, for the most part useless, nullify the efficiency of even the best troops. And in the first place, there are difficulties, and the cost of keeping the present available militia force supplied with the imperative munitions of war. Moreover, Congress has never shown itself very much alive to the needs of the land forces. Certainly out of the superfluity of its zeal for the new navy, it has had nothing to spare for the army and the militia.

The question of coast defense is an especially serious one, by reason of the inadequacy of the land organization. And yet the long stretch of coast-line on the Atlantic and Pacific shores of the Continent is virtually undefended. In the pigeon-holes of the chief engineer of the army at Washington are a score or two of schemes for repelling invasion, but obviously the most beautiful scheme that could be devised will not serve, when it exists on tracing paper alone, to keep out the intruder. Much has been said about coast defense in the annual estimates to Congress. Unfortunately the parsimony of that body, and the absence of any unanimity as to plans, have served in about equal degree to keep the nation in the position which, on this point, it occupied twenty years ago. Probably there will be a grand awakening before very long; but an elaborate system of fortification cannot be conjured up as by the waving of the enchanter's wand; and at present it is a fact that, save for a few forts along the Atlantic coast, there are no available means of preventing a landing at any given point ten miles distant from any given city. Portland (Me.), Narragansett Bay, New York, Philadelphia, Baltimore, Washington, Hampton Roads, Wilmington (N. C.), Charleston (S. C.), Savannah and Pensacola on the Atlantic shore and San Francisco on the Pacific, have each a network of submarine mines; but the value of this provision is largely neutralized by the fact that attacking warships could destroy the cities by the aid of their long-range guns without coming anywhere in the immediate neighborhood of the mines themselves. There are mortar batteries in addition to the mines at San Francisco, New York, and Boston, but the argument applies to these as well. At the last summer session of the Naval War College at Newport (R. I.) the possibility of a war with England was the chief point brought under discussion, and one of the leading naval experts summarized the position in regard to coast defenses in these words, which one need not apologize for quoting:

"The coast defenses are yet to be built practically, and the original plans for this system of protection have no value to-day, for the methods and means of naval warfare have changed since the original plan was adopted twenty years ago. It will take many millions adequately to protect our coasts, and many years at the present rate of construction to surround our ports with the means of repelling an enemy. This discussion of our ability to defend ourselves against the attack of a great nation does not embrace that time, long hence, when we shall have built our coast defenses. It deals with to-day's conditions, and they are, so far as the coast defenses go, wholly inadequate to the real needs. * * * The very nature of our position with its immense line of coast makes it almost impossible, indeed, to ade-

quately protect our seaports from a naval foe. The work of protecting other cities (than those named above) will proceed as rapidly as Congress will allot the money, of which a large sum is required. It is not certain that even these expensive land batteries will prevent the advance of an enemy. There are abundant examples in history of the daring of commanders, and during the war there were many instances of ships 'passing the forts.'"

After what has been shown and after the admissions of this expert, it may be assumed, without further discussion, that the American coast defenses, as they exist, could not avail to keep out an invading force of a sufficient degree of strength to sweep the seas of the country's vessels of war.

From all the foregoing remarks—which are based upon information that may be accepted as reliable—concerning the actual condition of the American defensive forces, there is but one inference to be drawn, and that inference is that America is not prepared for war. There is no doubt that the executive heads are fully alive to their shortcomings, and while they continue conscious on this score, the noisy ravings of the Jingo gentry (who rave only for political purposes) need excite no trepidation in the mind of the most nervous old lady alive. In the course of conversation with various American authorities, naval and military, we have elicited plain acknowledgments of the nation's weakness. They have been unanimous in laying the blame upon Congress. The policy of that body has always been to keep down expenses, especially in respect of the land force, to as low a limit as possible. The pension list is so enormously large that only a very small proportion of the national revenue can be diverted to other channels. Thus, last year 141,395,228 dollars were distributed in pensions, while the expenditure for the military establishment, "including rivers and harbors, forts, arsenals, and sea-coast defenses," did not exceed 51,804,759 dollars, and for the naval establishment, including the cost of new vessels, machinery, armament, equipment, and improvements at navy yards, was only 28,797,795 dollars. For the current fiscal year the army expenditure is estimated at 55,000,000 dollars, and that of the navy at 28,000,000 dollars. But last year nearly one-half of the outgoing in respect of the navy was under the head of "increase of the navy," which means that something like the same amount is to be disbursed this year under the same head; while there is only an increase of a little over 4,000,000 dollars towards the greater efficiency of the land force. Even the sum total of 55,000,000 dollars represents no material increase of the average, for in 1894 the expenditure on the military establishment was 54,567,929 dollars. Comparing the several items for these two years, we find an increase of 427,309 dollars on works for the improvement of harbors; but the Ordnance Department shows a decrease of 1,173,074 dollars, while last year the sum spent on the improvement of rivers was 417,118 dollars less than in 1894, and the sum spent on miliiary posts was 222,163 dollars less, or a reduction in the case of the last named of fully one-fourth. There can be no reasonable doubt that the land organization has been allowed to fall into neglect. It is adequate only to a peace footing, and no advance upon that, even if

efficiency were maintained, means actual retrogression. Since the delivery of the bellicose message there has been some show of activity at Washington; and Congress, with a willingness and alacrity that would have come with a better grace at another and an earlier time, has voted a sum of money for war purposes. But the neglect of years—the neglect of drill, and the neglect of provision—cannot be repaired in a few weeks or months, even by a nation so nervous, so energetic, and so resourceful as the American.

Military Notes.

THE DEATH OF MAJOR POST, U. S. ENGINEERS.

THE Inspector-General of Fortifications thinks that the inclosed letters, referring to the death of Major Post, U. S. A., and late Military Attaché in this country, may be of interest to the Corps.

HORSE GUARDS, WAR OFFICE,
WHITEHALL, S. W., 23d January, 1896.

DEAR COLONEL LUDLOW:—As, for the time, head of the Corps of Royal Engineers, and as a brother officer, for as such I look on all Engineer officers, and especially those of a nation so closely connected to us by ties of blood and language as yours, I hope you will allow me to express to you our very deep regret at the premature death of Major Post, and our sympathy with the Corps to which you both belonged, and with his friends and relations in their loss.

It is a sad and sudden end to a career of so much promise, and I should be grateful if you could take such means as you may think fit to convey our message of sympathy to those concerned.

To many of our officers he was well known, and wherever known liked and appreciated, and by no one more so than myself. Our personal intercourse had always been most pleasant, as was indeed in earlier days that with many of your officers who in America invariably showed me the greatest kindest and hospitality. Believe me, yours very truly,

R. GRANT, Lieut.-General, I. G. F.

CORFU, February 5, 1896.

DEAR GENERAL GRANT:—I have to thank you most sincerely for your note of January 23d conveying in your own and the name of the Corps of Royal Engineers a message of sympathy and regret to our own Corps of Engineers, and to those still more nearly affected by the sudden and lamented death of Major Post. I beg to assure you that your letter will be appreciated in no ordinary degree by Major Post's brother officers and by his sorrowing family as an evidence of regard for his memory, and of the esteem in which he was held by those who knew him, abroad as well as at home, and of the good will and kindliness felt by yourself and the officers of the distinguished Corps of which you are the honored chief and representative. Believe me, General, very sincerely yours,

WILLIAM LUDLOW,
Lt.-Col. Corps of Engineers, Military Attaché.

Lt.-Gen'l GRANT, C. B., etc., etc., etc.,
Inspector-General of Fortifications, Horse Guards, London.

—*The Royal Engineer Journal*, March 2, 1896.

CONDENSED RATIONS IN WAR.

The recent experiments carried out in the United States Army by order of the Secretary for War with a view to reducing the bulk and weight of food without impairing its nutritive functions, serve to confirm the belief that the exclusive use of concentrated foods cannot be continued for any length of time without prejudicial results to the health and efficiency of the consumers. Necessity, however, knows no laws, and as "an army fights on its belly," so in war time it must live *sur les magasins ou sur le pays*. In the rapid movements of modern war when the transport has to be reduced to a minimum, or when an army passes over a country previously exhausted by the enemy; during the period of grand concentrations which precede and follow a battle, when all requisitionable supplies in a limited zone of territory will have disappeared in a few hours; and "for the decisive moments of the crisis"; the importance of condensed and ready-cooked food may be inestimable. Accidents again, arising from causes sometimes absolutely impossible to avoid, *e. g.*, the blowing up of a bridge, a flood, an accident on the railway, the capture of a convoy, or the like, may cause the men to be without food for so many hours as to exhaust them greatly, and some actions have been lost, others have remained infructuous, almost entirely from this cause. This can only be avoided by carrying compressed rations so as to make the troops independent of the supply trains for seven or eight days on emergencies, and to enable them to prepare their food under any circumstances the moment the march or battle is over.

In the German army each soldier carries in his pack a three days' ration, to render him temporarily independent of the regular daily issues. This is the so-called "iron-ration," composed of 3 lbs. 4oz. of biscuit, 13¼oz. of rice, 2⅛oz. of salt, 1 lb. 2½oz. of bacon, and nearly 2¾oz. of roasted ground coffee: it is to be used when all other means for feeding the soldier fail, and then only by direction of superior authority. The ration is frequently inspected, and any unauthorized expenditure of it is severely punished. It is, no doubt, a meagre diet to work upon for a few days, but if nothing more, it would always constitute a basis to which the supply officers would add anything they could lay their hands on. Without it there is at times no alternative but—to starve. In the Austro-Hungarian army the reserve food supply carried by each man consist of 17.6oz. of biscuit, 7oz. of preserved meat, $1\frac{3}{16}$oz. of preserved soup, salt 2oz., tobacco 2.4oz. The French soldier carries in his knapsack two days' ration of biscuit (3¼lb.), one day's ration of dried vegetables (2⅛oz.), three days' rations of rice (3½oz.), four rations of coffee and sugar, and two days' rations of preserved meat (14⅛oz.) To make these up for four days' supply, two days' rations of bread and fresh meat are provided by the *approvisionements des transports stratégiques*. The soldiers of the Japanese army, in the late war with China, carried an emergency ration of rice in a little tin case strapped to the top of their knapsacks. In the British army alone nothing has yet been done in this direction beyond the manufacture of a "meat-biscuit" of sorts by the Commissariat Department. When any rapid movement is made, the soldier is ordered to carry a couple of days' ordinary cooked rations in his haversack,

bulky in size and very liable to deterioration when carried for several consecutive hours on a hot day.

It is obvious that fresh meat and bread can have no place in an emergency ration; the constituents must be such as will keep well, be compressed in small bulk, and give in minimum compass the greatest amount of nourishment. But the experience of all campaigns proves that the great desideratum is the invention of a process of preparing and preserving alimentary substances in such a way that, while reducing their volume and weight, it will not diminish their nutritive yield. Trials are being constantly made in the great military kitchen of Mayence with this object, and it may be confidently predicted that the fortunate patentee of a thoroughly satisfactory process will reap a rich harvest. The pea-sausage (Erbswurst) made by mixing pea-flour and fat pork with a little salt, was highly prized for a time by the Germans in the Franco-German War, and the inventor received a bonus of 30,000 thalers (£4500). It has been much improved since then. There are numerous articles in the market out of which a good emergency ration could be made, *e. g.*, streaky bacon (8oz.) or pressed corned beef (12oz.) or a box of sardines (12oz.) combined with a tablet of pea meal mixed with Hassall's flour of meat for soup, an oblong tablet of chocolate and milk divided by marks into three portions (each weighing 1 oz. to make one pint), oatmeal biscuits (12oz. of water), or compressed bread (1 lb.) per cent., the whole ration for one day not weighing more than 2lb. and contained in two rectangular tin or aluminum cases for convenience of package in the valise, haversack, or the pockets of the greatcoat. Coffee and cheese do not keep well in hot moist countries, and as for salt the old soldier knows too well its priceless value on service ever to be without a supply of it.

If reports speak true, there were times in the early days of the late Chitral campaign, when, owing to the almost insuperable difficulties with which the supply officers had to contend, a ration modelled on the above scale would have been a great boon to both officers and men. Theoretically speaking, the amount of water free food required to keep the body in full activity has been calculated to be about 26oz., but in practice the dehydration and compression produced by this amount of concentration not only appear to affect the alimentary value of the substances concerned, but also to lessen their digestibility and assimilation. This has been particularly observed in the case of fresh vegetables desiccated and subjected to enormous pressure in a hydraulic press (Chollet's process). A sudden change from ordinary field-rations to this class of diet must also exercise some influence in producing the sensation of hunger, indigestion, and intestinal troubles, which are sometimes associated with the exclusive consumption of condensed food. But all this goes to prove that the latter should be considered as a reserve kept in readiness for occasional issue on emergencies, and given if possible in addition to the usual rations issued by the Supply Departments. In the late experiments in Colorado, various concentrated food tablets were employed, but it is said that more than half the men who were victims to the experiment became candidates for hospital treatment. For instance, the report states: "A company of the 7th Infantry at Fort Logan, near Denver, was detailed,

and furnished with condensed rations consisting of coffee, soup, bread, and bacon. The coffee and soup were in small tablets, which when placed in boiling water, were ready for consumption in two minutes. The bread was in small flat cakes, the weight and hardness of brick, but when moistened, swelled out like a sponge. The bacon was compressed, and needed only to be warmed in a frying pan. The soldiers started out with 10 days' rations, but the campaign was brought to an abrupt end after four days' of 15-mile marches. The food not only did not satisfy the hunger or give strength, but seemed to irritate the stomach. After the first meal, two of the enlisted men had to be placed under the surgeon's care. At the end of the second day thirty out of the seventy men in the company were ill, and on the fourth day the whole command went into camp, and couriers were sent to town for hard tack and ordinary coffee and bacon. Some of the soldiers were seriously ill with stomach complaint, and were confined to the hospital for several days." Assuming that these rations were of good quality, and that the soldiers were healthy men, with sound teeth and ordinary digestive capacities; it is hard to reconcile the bad effects quoted above with the experiences of the Burma and Nile campaigns when our soldiers were fed almost exclusively on "bully beef" and ration-biscuit, and yet though they endured great hardships, and did a maximum amount of work, there is no evidence to show that they suffered unduly in health from the food issued to them. The men, however, thoroughly disliked these rations after a time, and wasted them recklessly. The want of variety was of course very objectionable, and there were grumblings on this score.

Few will agree with the American authorities that ration-biscuit (hard tack), though undoubtedly possessing many advantages as being easily transportable, and as being bulk for bulk more nutritious than bread, is the most practical service food obtainable. On the contrary, its use is not free from grave objections. It is deficient in fat, after a time it seems difficult of digestion, and certain it is that men do not thrive well upon it for long periods. In war it has always been the rule with the best army surgeons for more than a century to regard it as *un aliment de necessité* to be issued only in cases where it cannot be avoided. This is owing to the great difficulty, if not impossibility for ordinary mortals except those endowed with cast-iron "mouth furniture" to masticate the tough morsels, the only remedy being to steep them in water, which makes them pulpy and unpalatable, or in coffee, soup, or other kindred beverages, which is not always practicable. If eaten in the dry state, and insufficiently triturated, the hard angular fragments act as a mechanical irritant, and cause what is well known to and called by the French soldier *la diarrhée du biscuit*. Tommy Atkins equ lly with his French *confrére* simply loathes it, and so great is the repugnance of the latter to the obnoxious aliment that according to Véry (Encyclopédie d'Hygiene) out of 122,000 quintaux that were issued only 200 were consumed, the waste representing a loss to the Government of 5,000,000 francs (£200,000).

The history of the attempts and failures for the past few years of the Intendance of the French army to provide a remedy for this disastrous state of things by replacing biscuit by a suitable *pain de guerre*, is very in-

teresting. At first an attempt was made to desiccate the ammunition bread, but the plan had to be abandoned. It was found after exhaustive experiments in the military bake-houses that in order to bring down the water in a loaf weighing 750 grammes (26 oz.) to 12 or 14 per cent., a period of between 30 and 40 days was required; and moreover that when the residuum was remoistened for use, its edible qualities were far from satisfactory. According to the *Medical Magazine* private enterprise was now enlisted, the result being a long series of failures, all more or less complete. At last, in December, 1892, the Administration resolved on making an extended trial of the compressed bread of Perrier, and a large quantity was issued to the army. After a two-years' trial, both in France and Algeria, the reports called for were fairly favorable, but before coming to a definite conclusion in the matter the Minister of War issued a circular, dated 10th April, 1894 calling on all persons engaged in the baking trade to enter into competition for the production of a war-bread, that is to say, "a substance occupying very small space, but including, nevertheless, the whole of the qualities, nutritive and digestive, of ordinary bread." According to the terms of the circular, the required product was to keep good for a year, without manifesting the slightest sign of deterioration. Its dimensions should admit of its being packed in the soldier's valise, and its substance should be sufficiently resistant to withstand the shocks and compression of ordinary transport. The materials used were to consist exclusively of soft wheaten flour, paste, leaven, water, and salt. In shape each portion was to be square or rectangular, with a due proportion of crust; the crumb was to be white and porous; and the taste and smell both agreeable to the senses. Finally, the siccity must be perfect, there must be no crumbling, and every loaf must swell out completely to the standard size within ten minutes' immersion in water at 50° C. These specifications constituted a "tall" order, and as the competition seems to have failed to produce a specimen superior to Perrier's compressed bread, the latter has been now definitely adopted in the French service. The issue of biscuit to the troops ceased on the 1st of January, 1895. As this measure is bound to exercise a very important effect on the well-being and efficiency of the soldier on active service, it is to be hoped that the government of India will recognize the expediency of taking up the matter offering, say, as a first step, a prize for the best specimen of a compressed 1 lb. war-loaf fulfilling the conditions laid down in the above quoted circular of the French Minister of War.—*Pioneer.*

PISTOLS.

At the Royal United Service Institution, Lieut.-Colonel G. V. Fosbery, V. C., read an instructive paper on "Pistols," and in a very interesting manner, followed the pistol through its many transformations, from the horseman's dag of the fifteenth century to the revolver of to-day, proceeded to consider its place amongst military weapons and its most effective sphere of action. He expressed the opinion that while almost every pistol is made sufficiently accurate to shoot well at distances at which it would be folly to use it, stopping power was sadly neglected in almost all with which he was acquainted, whether Belgian, English, or American, always excepting the Colt's fron-

tier pistol carrying the cartridge of the Winchester repeater. As, however, if only the bore was large enough, this power could be conferred by the use of a properly constructed bullet, and a charge of powder calculated rather for this purpose than for range and penetration, the fault could be remedied. There were two ways in which a man might be stopped, even supposing him not to be hit in what was called a vital spot like the heart or head. Of these one was what was often, for want of a better term, called the explosive effect of an express bullet. He did not mean by this the mischief done by the breaking up of a soft lead hollow-headed projectile, but that caused by the passage of a bullet which was in itself no way deformed by the process, but which had a velocity of 'not less than 1700 to 2000 feet per second. Such a bullet would leave a barely perceptible puncture at its place of entrance, but a comparatively huge hole at its point of exit, causing such a wound as would stop almost anything.

This action, which was confined to bullets having velocities such as that above named, was to be explained by the fact that the speed of the bullet gave no time for the materials lying in its path to be pushed to one side or the other, and so allow of its passage. They therefore became heaped up in front of it, and driven out before it in a mass, much like the water forming the bow wave of a ship at high speed.

With the Service pistol and our present charges of powder, while we had a heavy recoil, we got an initial velocity of no more than 700 feet per second, to which we should have to add at least another 1000 feet in order to obtain the explosive effects before mentioned. We might, therefore, at once abandon this idea, and turn to what would offer a better chance of success. There was, it appeared to him, only one such plan available, which was to cause such a shock to our enemy's system as would cause him to defer his attack till some other opportunity. In order to give this shock it was necessary to increase by every means in our power the blow to be struck by our bullet in the first instance, and see that he got the full benefit of it in the second. It was clear that if we put enough powder into our pistol to drive the bullet clean through a man, and a long way out into the country behind him, we were wasting all the energy necessary to take that bullet through his skin for the second time, and to that distance also, whatever it might be, whereas evidently the bullet should remain in him, and the energy wholly wasted in the former case be usefully employed in stopping him. In the preparation of our pistol ammunition we had, the lecturer feared, striven too much after range and penetration (excellent things in their way, but not needed here), while the other side of the question did not appear to have been sufficiently considered. Hence we had a velocity not high enough to produce velocity effects, and yet far too high for the method he now proposed to use; so high, indeed, that its recoil made even experts gun-shy, destroyed all comfort in the use of the weapon, and seriously affected its off-hand shooting, whatever it might do in the fixed rest. Men would flinch, train them how you might, from the kick of the Service pistol, and all knew the effects of their doing so.

These disadvantages would all disappear, and our pistols become at once the effective close-quarter weapons they were designed to be, did we boldly

set to work to diminish our charge of powder, to add to our weight of lead, and to flatten the points of our bullets; for by these means we should decrease penetration (of which we had too much), increase the force of our blow (of which we got too little), and we might rely on the range being sufficient and the shooting good, if only our bullet was well balanced and our charge properly proportioned. Captain Taekels, a Belgian officer, who devoted much attention to these matters, in his "Etude sur le Pistolet," proposed to use in a 12-millimetre revolver (.470) a round bullet, which, he said would produce all the necessary effects. Here the lecturer disagreed with him. In the .450 pistol we had adopted, by using an elongated flat-headed bullet, we could get in far more lead than the former could, while the flat surface would meet with more resistance, and therefore give a heavier blow than a hemisphere. No doubt a still heavier blow, with the same weight of lead, would follow the employment of Lord Keane's cross-cut bullets, or other similar means by which to combine higher velocities with less penetration. Whatever we might have to do later on, to increase the effect of the .303 bullet—which, indeed, sadly needed it—the lecturer would be sorry to recommend any such projectiles for use in our pistols. With the flat-headed bullets he ventured to recommend the case was different. The wounds made by them would, in the long run, probably prove less severe, though more immediately deterrent, which was what we required. Unfortunately, we had no better representative resistance than half-inch elm planks soaked in water, and placed the same distance apart, by means of which to ascertain how far a pistol bullet would enter the sort of target it was intended to be used against. Something better than this might have been designed during all the years we had had to think about it. Nevertheless, isolated experiments had been made from time to time which had thrown a little light on the subject. He had himself seen and handled a pistol of about .450 calibre so loaded as to produce the very effects here spoken of. It shot admirably at twenty-five paces, had no unpleasant recoil, and yet one of its bullets would knock a man down as well as could be done with a blow of the fist. This, he believed, was due to the points of the bullets having been cut off square, and the charge of powder considerably reduced.

He had lately undertaken certain experiments based on the general ideas put forward in his paper, but, so far, had only arrived at certain general conclusions. He hoped, however, soon to be able to satisfy himself fuliy on the subject; and should his conclusions warrant his doing so, he should try to persuade some of the makers of ammunition to prepare such a quantity as to enable others to verify or contradict the theories he had put forward.

In our modern pistol, whether we loaded it for range or the delivery of a stopping blow, there would always remain a recoil sufficiently heavy to be unpleasant, and any plan that would absorb or diminish this would tend to our advantage. An India rubber recoil pad or sleeve, the invention of Messrs. Silver, not only did away, in a measure, with the jar on the wrist, but changed the form of the stock into something like the old saw-handle of the duelling pistol—quite the best form to give a firm hold and first-class shooting. It

had only one fault, that of bringing the middle finger too close to the guard, where it is apt to be bruised by the heavy recoil. Again, the kick was almost entirely absorbed in the case of the new automatic Borchard pistol, now being made by Messrs. Ludw Loëve, of Berlin. This was a strange looking weapon, but was nevertheless easier to shoot with, and more convenient to handle, than many another to the form of which our eyes were accustomed. It had a light wooden attachable butt, with which excellent shooting could be made at 500 metres. It fired eight shots of small calibre (.303) as fast as one could crook his trigger finger.

Colonel Fosbery then proceeded to say a few words as to the use, and declared that if, as he maintained, they were weapons for close quarters, and not to be used beyond twenty paces, such hints as he was about to offer could be easily followed. The eye being fixed on the object it was intended to strike, the pistol could be brought at once to bear on the vertical line which bisected it. There should be no lateral correction of aim necessary for an object or person at rest. Attention should then be paid to elevation only and picking it up quickly. Whether the weapon should be fired with a rising or falling hand, when fine shooting at a target was in question, must be left to every man's own judgment. There could be, however, very little doubt but that against an armed antagonist the pistol should be coming down when the bullet left the barrel; the muscles of the hand were then in a condition of tension more likely to resist a throw-up. There was less chance of shooting over him; you might hit him a little low perhaps, but you would always hit him somewhere. Some might object that to raise the pistol and then bring it down took longer than to bring it up only, the hand having further to travel. But circumstances which would make this fraction of a second of vital importance were rare indeed. The mind is at rest once the enemy was well covered, and a pause to make finer shooting was then in order. If, however, time pressed, a snap shot from the hip would tell, nine times out of ten, at close quarters, and, if not, would generally gain time for a more deliberate aim with the next barrel. For snap-shooting no plan was better than to pull with the middle finger, extending the index along the weapon and parallel with the barrel. You could always point at anything your eye was fixed on; and here, therefore, the ball would follow the eye without the necessity for any aim whatever. A man, however, must beware that his finger does not project across the space between the chambers and the barrel, as the escaping flame cuts like a knife. It would be useful were a small shield for the finger attached to the pistol at this point. Finally, the lecturer urged anyone who might need to use a pistol to practice assiduously, and with the left hand as well as the right. Any one could let off a pistol, but no weapon required more practice to make a first-class shot, and, above all, a quick one.—*United Service Gazette.*

CYCLING AND THE SADDLE.

Bicycles have taken the country and the world by storm and are fast coming into universal use. That they have accomplished no end of good none will dispute; that they have brought with them certain evils, though not perhaps understood by people in general, is distinctly recognized by the

medical profession. This does not result from any defect necessarily inherent in the bicycle, but from faults in its construction, particularly in the saddle employed. Speed has been quite generally the object primarily aimed at, the health of the rider being given very little consideration.

From a medical standpoint bicycle saddles are, as a prominent New York physician expressed it in a recent article, "physically and morally injurious. The entire weight of the body comes on the soft tissue of the pelvic floor. The sensitive tissues, subject to such pressure and irritation, must suffer, and the evil cannot yet be estimated."

As all physicians are well aware, few persons afflicted with urethral, prostatic or bladder trouble are able to ride a bicycle without materially increasing the difficulty. This must be distinctly charged to defective saddles, and the same cause will produce disease in perfectly healthy people. Hence the importance, the absolute necessity, of using a proper saddle cannot be exaggerated.

As the writer referred to aptly expresses it: "A perfect saddle for either man or woman is one that will maintain the body in an easy and proper position. It must be a surface large enough to receive the tuberosities so that the weight comes on the gluteal muscles. It should have, like an army saddle, a hole in the centre, to relieve any injurious pressure. This will prevent urethritis, prostatis, prostatic abscess and costitis. The saddle should allow pedaling without needless friction. The rider should have a firm yet elastic seat."

In the Christy Saddle Messrs. A. G. Spalding & Bros. have secured a bicycle saddle that fully meets all the demands and satisfies at once all medical and scientific requirements without losing any possible advantage in other directions.

It is moulded in strict anatomical conformity to the parts of the body with which it comes in contact; comfortable yet firm cushions are employed and so adjusted as to properly receive the bony prominences of the pelvis. These cushions, which are removable, rest upon a perforated base and, with a free circulation of air through the horn of the saddle, insure a cool seat, a most important consideration from the standpoint of comfort as well as hygiene. The frame is made of metal and maintains its correct position under all circumstances. The saddle is easily adjusted at the proper angle. Numerous testimonials from eminent surgeons declare this saddle to meet all medical requirements, while eminent riders give it the highest praise.

THE JAPANESE SOLDIER.

Seeing the strides which Japan is making towards perfection in matters of military organization it is interesting to note what Captain G. F. Elliott, of the United States Marines, says on the subject of the Japanese soldier in his report to the Navy Department at Washington. Captain Elliott recently commanded the American force landed at Söul during the troubles, and later on was in charge of the Marine detachment held in readiness at Tientsin to proceed to Pekin in case of need during the late war. He writes:—"The quiet, soldierly discipline of the Japanese troops astonished all foreign officers who had the opportunity of observing them while dis-

embarking, on the march, occupying camps near, or while billeted in cities not their own. Japanese infantry regiments are homogeneous physically; the men do not vary more than two inches in height, seven years in age, or more than 20 lbs. in weight. In the field they are not burdened with overfleshy men, neither with the 'faithful old soldiers' whose pride has outlived their strength. Forced marches did not leave a fourth of the regiment straggling in the road, and the endurance of the men could be counted on nearly as a unit. Undoubtedly they are brave, but have not been tried in large bodies up to a demoralizing loss, although small parties on one or two occasions were cut off and fell together like true soldiers. Whether they will be subject to panic under heavy reverses is not known. They are fairly well set up, but do not show it as much as the Regular foreign soldiers; good weight-carriers, but I believe slow marchers, although for short distances they get over the ground very rapidly on a trot, having what is known as good wind. Drill has in a great degree eliminated the native peculiarity of being pigeon-toed. In marching they step too much from the knees, and do not move out from the hips; this, I think, is due from the use of the *kimono* in early life."

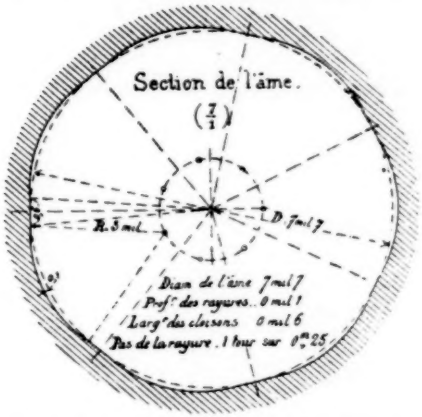
With regard to the rifle used by the Japanese and the nature of the wounds caused by it, Captain Elliott goes on to observe:—"All rifles are made at the arsenal in Tokyo and are called by the inventor's name, Murata. They are of two patterns. The one used by the great majority of the troops was a single-loading bolt gun of .44 calibre, sighting to 1400 m. without wind gauge; the other a magazine gun of .315 calibre. The stocks are very short and the cheeks wide." As to the effect of the rifle bullet wounds Captain Elliott reports:—"While in Tientsin, China, I visited several times the hospital under charge of Dr. Irwin, surgeon to Viceroy Li Hung-Chang. Wounded Chinese soldiers were treated here during the winter. Surgeon-Major James, of the British army, had charge of some of the wards, and was much interested in wounds made by the small-calibre enveloped bullet. He kindly gave me every opportunity to see and much information in regard to these wounds. I saw about thirty of the wounded. In no case were bones shattered to any extent, even at the exit of the ball. The puncture was clean; no bullet was found in the patient, so the casing was unknown, whether of steel or a softer metal. They did not seem to deflect on striking, but cut their way through in the line of flight. Thirty patients testified they had received their wounds at distances varying from 150 to 400 yards. They healed readily, often by first intention. None of the wounds were in the leg, for the men had made their own way from the battle-field on foot or in carts to the railroad, more than 200 miles, and were several weeks on the road. All suffered more from frost-bitten feet than the bullets. Out of the thirty cases I saw I think probably the old .45 calibre lead ball would have left on the field nine of them dead."—*United Service Gazette.*

MODIFICATION OF THE FORM OF THE GROOVES IN THE LEE-METFORD RIFLE.

The effects of erosion produced by the combustion of cordite in the bore of hand arms and field-guns has been the cause of frequent discussion in

the English press. Although many of the statements made were for the most part exaggerated, according to *The Engineer*, they nevertheless rested upon a basis of truth.

The English government, as a result of experiments undertaken with a


Section de l'âme.
(7/1)
D 7mil 7
R. 3 mil.
Diam de l'âme 7mil 7
Prof.r des rayures. 0 mil 1
Larg.r des cloisons 0 mil 6
Pas de la rayure. 1 tour sur 0m.25

view to correct the evils complained of, has just adopted a new profile for the rifling of the Lee-Metford arm which differs from that which preceded it in having deeper grooves and wider lands. This change causes no modification in the cartridge.

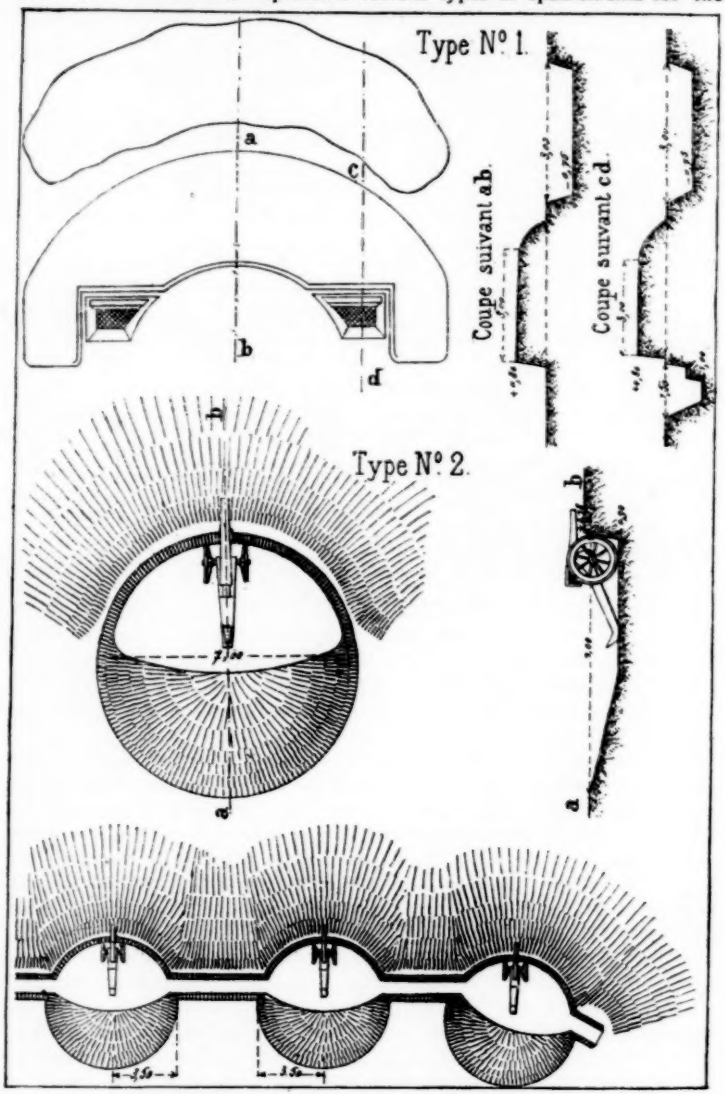
The above cut taken from *The Engineer* represents a section of the barrel under present conditions.—*Revue d'Artillerie.* J. C. B.

THE FOLDING BICYCLE.

A most interesting and important step in advance has been taken in connection with military cycling. Captain Gérard, of the 87th Regiment, at St. Quinten, as is well known, recently invented a portable cycle (*bicyclette pliante*), which enables its rider to unite in his own person the speed of the horseman, and more than his lasting power, with the facility of the infantryman in fighting over any kind of country. On good roads or hard ground the wheel carries the soldier, while on difficult ground the soldier carries the wheel. This folding machine did splendid service in its experimental stage between St. Quinten and Ham at the last great garrison operations. Twenty-two men of the 87th Infantry were supplied with it for trial purposes, and each of them traversed a distance of more than 1200 miles, folding up and again starting the cycle 300 times without a hitch. A further advance has been made by the manufacturer of the machine. He has coupled two such cycles together, forming a four-wheeled carriage, under the name of the "Military Sociable," and enumerates among its advantages that it can be used for transport and for removing the wounded; that it will greatly save the horse of an army; economize space and labor; and can be used by comparatively unskilled hands.—*Revue du Cercle Militaire.*

RUSSIAN FIELDWORKS FOR ARTILLERY.

The accompanying sketch, reproduced from the "Russian Instructions for Field Fortification," represents various types of epaulements for the



ÉPAULEMENTS DE CAMPAGNE DE L'ARTILLERIE RUSSE

field guns now in use. In type No. 1 the piece is placed on the natural surface, the epaulement being formed of earth taken from a ditch dug out in front, while at the sides are shelters for the cannoneers.

In type No. 2, which is used by preference, the platform is sunk 0.90 m., the earth from the excavation being thrown out in front and at the sides so as to increase the protection. The cannoneers shield themselves by sitting at the foot of the slope or by digging a lateral shelter as in the first case.

It takes 12 men 3 hours per gun to complete the work. The epaulements of neighboring guns can be united as indicated in the sketch, the distance between the axes of any two consecutive pieces being from 12 to 20 paces (8 to 14 metres).—*Revue d'Artillerie.* J. C. B.

THE DUDLEY "POWDER-PNEUMATIC" GUN.

The accident which occurred at the recent trial of this gun, in which a shell prematurely exploded, has, it is said, demonstrated no defect either in the principle or construction of the weapon. It has shown only the defective character of the type of fuse used for igniting the shells. As the method of obtaining a high pressure quickly in a considerable mass of air, which underlies the action of the gun, seems capable of extension to useful industrial purposes, we present here an abstract of the description given in the *Scientific American* (April 25).

Gunpowder, when burned behind a projectile in a gun, acts upon the projectile to move it forward exactly as steam acts upon a reciprocating piston, except that the inertia of the projectile, its friction in the gun-barrel, and external air pressure are the only elements of resistance in the gun, while in the steam cylinder there are added to these elements the friction and inertia of other moving parts at all times, and the mechanical work performed by the engine upon that which constitutes no part of its structure. The mere fact that far higher pressures are practicable in guns than in engine cylinders is a distinction of degree only; the main principle of action is precisely the same for both. The pressure of a confined gaseous body upon an inert mass is the immediate origin of power and of work performed by each.

In the steam engine the gas of water, produced under pressure in the boiler, is the immediate agent; in the ordinary gun, the gas produced by the powder is the immediate agent. In pneumatic guns, air compressed by some means (usually by a machine called an air-compressor) is what moves the projectile. In the Dudley "powder-pneumatic" gun, machine compression is avoided, and the compressed air is at once obtained by the explosion of gunpowder, thus dispensing entirely with the ponderous air-compressing machinery hitherto used, and adapting the gun to field-service.

Gunpowder has been previously used to generate power in mechanical operations other than the throwing of projectiles and the blasting of rocks. The gunpowder pile driver has been, perhaps, the best known of these applications. But it is the particular method of gaining the store of compressed air in the Dudley system that is suggestive of applications in other fields. In the gunpowder pile-driver, and other attempts to utilize the

gases of gunpowder as a source of mechanical power, no storing-up of power has been accomplished. In the method employed by Dudley, the compressed air may be held indefinitely for future use. The practical advantages of this feature of the invention will suggest themselves at once to all mechanics.

"Three tubes constitute the principal elements. These lie parallel to each other. A long central tube is the firing tube. The two side tubes are connected by an air passage at their forward ends, which ends are closed. The rear end of the left-hand tube, also closed, is connected to the rear end of the central barrel or firing tube. The right-hand tube and the firing tube have breech mechanism, like that of a breech-loading rifle.

"The action and manipulation of the piece is simplicity itself. A metallic powder cartridge is inserted into the rear end of the right-hand tube, and its breech is closed. A torpedo is placed in the central tube, whose breech is then closed. The powder is fired. The air in the tubes is compressed by the gases generated from the explosion, the pressure rising to eight hundred and fifty pounds. The force of the explosion, cushioned by the two columns of air intervening between the powder and the projectile in the central tube, acts upon the projectile. With a slight noise and without a particle of smoke or flame the projectile is driven out of the barrel and passes smoothly through its trajectory. About the same effect is attained as with the regular pneumatic gun. The extensive air-compressing plant of the latter is, in the case of the Dudley gun, represented by a simple blank cartridge."

The safety attachment to the Merriam fuse used with the projectiles is a very ingenious device.

"The Merriam fuse operates by inertia or by direct impact. If the shell strikes the water, the inertia operates the ignition. A steel ball within it is driven forward, owing to the retardation of the motion; and the ball, by striking, causes the detonation of one or more percussion caps, three being used to insure firing. The ignition of a tube of slow-burning powder is thus effected, which communicates with the fulminating mercury and so explodes successively the gun-cotton and the main explosive in the shell. The period of the explosion is determined by the slow-burning powder; by altering it, the time element can be regulated with the greatest accuracy.

"For attack upon armor, instant detonation is required, and this is secured on the direct-impact principle, by crushing in of the head, and the driving back of one to three firing pins, which ignite quick-burning powder, the fulminate, the gun-cotton, and the main explosive in instantaneous succession.

"The element of safety is introduced in the Merriam fuse by a little windmill, or vane, on the front of the fuse. This is inclosed in a recess, whence it escapes as the shell leaves the gun, and instantly begins to turn, actuating a screw which has been screwed down upon the firing ball. After the shell has travelled a few hundred feet, the ball is free to work the instant the shell is arrested in its flight."

The gun weighs about a ton, including the mount, and, it is said, is capable of throwing shells weighing thirty-two pounds, with an initial velocity

of seven hundred feet per second. The recoil is very slight.—*Engineering Magazine.*

THE NEW "BRANCARD" WHEELED TRANSPORT FOR THE CONVEYANCE OF SICK, WOUNDED, AND AMMUNITION IN THE BELGIAN ARMY.

Each company of the field army has now been provided with one of these. In the estimation of the writer the arrangement supersedes all others that have appeared up to date.

It is an invention of Herr C. de Mooy, staff medical officer of the Belgian army. He has attempted to avoid, as far as possible, all violent horizontal or vertical movement in the transport of sick and wounded, and has also had in view the diminution of draught power and time, thus saving in personnel and money to the utmost extent. There can be no doubt that the experiments have been attended with brilliant success.

The "Brancard" is in two parts, the "Brancard" proper, which will carry one or two men, and a wheeled frame on which the "Brancard" is placed.

The frame consists of two very high wheels joined by an axle bent up in the centre, and on which there are round iron springs 7½ feet long.

By pushing or sliding the springs backwards or forwards into boxes, the weight of the "Brancard" can be so adjusted as to remain permanently balanced. By an arrangement of chains one man can easily fit the "Brancard" on to the frame, and a total weight of 20 kg. (450 lbs. about) can be pushed along a level road by a child.

During a 5 hours' march one man was able to push the cart without any difficulty with a load of 20 kg. of ammunition (about 500 lbs.) Herr de Mooy intends to adapt this cart for the transport of ammunition, rations, and stores, etc., several experiments having been made with the best results during the autumn manœuvres with a special ammunition cart constructed on this principle.

Experiments made in the transport of sick showed that a soldier who had travelled for 1½ hours in the "Brancard" had fallen fast asleep and had to be shaken to be awakened. A medical officer was able to write with perfect ease during the movement of the cart.

The "Brancard" is further provided with a hood as protection against rain, wind, and sun, which also makes a tent for one man. It is also fitted with a sheet iron box for dressings, bandages, etc., and there is ample room for clothes, food and drink in pockets.

The whole thing is so simple and practical, that a soldier can learn to use it at once. Indeed space fails to describe all its advantages, and there is no doubt that it will soon become known far and wide.—*Militär Wochenblatt.*

THE ATTACK FORMATION OF THE CIVIL WAR.

The points of contrast between ourselves (British) and the Americans are far too numerous to be dismissed without comment. They began the war with a drill-book and system modelled on our own, and they carried it out to its conclusion, with only a few modifications of detail, but none of principle. The normal prescribed idea of an attack appears to have been

as follows: A line of scouts, thickened to skirmishers according to the requirements of the ground; from 200 to 300 paces in rear, the 1st line, two deep precisely like our own, then in rear a 2d line and a reserve. Of course their lines did not advance with the steady precision of our old Peninsula battalions. Their level of instruction was altogether too low, and besides the extent of fire swept ground had greatly increased. Eye witnesses say, that after the first few yards, the line practically dissolved itself into a dense line of skirmishers, which threw itself forward generally at a run as far as their momentum would carry them. Sometimes if the distance was short carrying the position at the first rush, but more generally the heavy losses brought them to a halt and a standing fire ensued. They knew nothing of Scherff's great principle on which the "Treffen Abstande," or distances between the lines are based, but they generally worked it out in practice pretty successfully. The second line came up in the best order they could and carried the wreck of the first on with it; if they were stopped, the reserve did the same for them, and either broke too or succeeded. The principle that every attack should be prepared by artillery fire, though known, was yet imperfectly understood, and the want of artillery and still more the difficulty of the ground frequently led to its being disregarded, but the neglect was dearly paid for as a rule. Of course, things did not always work out in practice as they were intended to. Hot-headed brigadiers and inexperienced staff-officers frequently caused single lines to be sent to certain destruction; others were responsible for losses of distance and time which left the front line unsupported at the critical moment; but as the war went on, the necessity of putting in men in greater numbers, viz.: providing by successive lines, 6, 8 and even 10 men per yard of front made itself more and more felt, and at last whole corps were sent to the attack on a front of over 3000 yards and in five successive lines. There was nothing in the Franco-German War to compare to these monster attacks; in that campaign, attacking corps generally resolved themselves into three or four isolated advances not exceeding a brigade (6000 men) in strength, and want of combination in time and direction frequently made itself most detrimentally felt, mistakes not liable to occur again, the lesson was too bloody. We do not advocate these monster attacks, for there is a limit of front in attacking (about 2200 yards) which cannot be usefully exceeded, and for this a strength of two British or one Continental brigade will usually suffice; greater extension only leads to an unnecessary expenditure of men.—*Maude. Letters on Tactics and Organization.*

Comment and Criticism.

I.

"The Sioux Campaign of 1890-91."

First Lieut. H. L. Hawthorne, 1st Artillery.

THE description given by Lieut. Richardson of the fight at Wounded Knee, in his paper on the Sioux Campaign of 1890-91, impresses me with the belief that he took the trouble neither to read carefully the reports of the men who led in this struggle nor asked for information from the many eye-witnesses within his easy reach. Although this author disclaims any intention of presenting a history of this campaign, nevertheless he deals with matters of historic value, small perhaps, but still history, and he owes, therefore, the readers of the JOURNAL, who are without personal knowledge of the matter set forth, an honest and earnest endeavor to obtain his evidence at first hand. From my knowledge of the events of December 29, I cannot believe that Lieut. Richardson made up his sketchy account of that day's troubles from matter furnished him by participants or eye-witnesses. I may be wrong, but if so, then Lieut. Richardson has either misunderstood his informant or he has not sought the best source for his information. The principal items in his account of the fight, or as it seems to be eternally dubbed, the "unfortunate affair" at Wounded Knee, are as follows:

1. Revengeful feeling of the 7th Cavalry, in memory of Custer.
2. Indians surrounded on three sides by "lines of armed soldiers."
3. Fight opened as search began.
4. Indians opposed by more than four times their number.
5. Fight unexpectedly (to the Indians) precipitated.
6. Mountain guns fired long after resistance ceased.
7. Indian testifies to the killing of women and children by troops.
8. Indians testify that soldiers shot each other.
9. 185 Indians killed.

These nine items around which the author's story is woven are quite incorrect and most of them wholly imaginative.

There were but about five officers present who were with the 7th Cavalry in the '76 campaign and these did not include the commanding officer nor the second in command at Wounded Knee. Of the men, there were very few indeed who were members of the regiment in that fatal year. To say that there was room under such conditions for a display of savage revenge on women and children is an unnecessary and groundless accusation.

The Indians were not "surrounded on three sides" by the soldiers unless tactical dispositions some distance away of mounted troops could be so designated. Immediately confronting the Indians were parts of two troops. These had been placed between the circle of savages and their camp during the search of the tepees, as they showed a disposition to interfere. On the flanks of the circle were small reserves to supply sentinels over the camp, placed there the evening before; but *these were posted with especial reference to their duties as guards.*

The attempt at disarmament was conducted with moderation and care, the Indians having been given three opportunities to surrender their arms peaceably. They were asked, first, to return to their tepees by twenties and bring out their weapons. This proved a dismal failure; indeed, the first squad of twenty, after a long wait, had to be brought back to the circle by the soldiers. A search of the Indian camp was then ordered, resulting in a pile of trash consisting of a few muzzle-loading muskets, old Springfield carbines and bundles of bows and arrows, probably belonging to the children. As we had seen a line of 120 well armed warriors in front of us the day before, General Forsyth knew what he was looking for. There remained, finally, the persons of the savages to examine, but this was not attempted until the search *was over* and not when the search *began*.

There were, all told, about 300 cavalrymen and 20 artillerymen on the side of the troops and 120 fighting men on the side of the Indians. Lieut. Richardson therefore missed his proportion of four to one by 160 soldiers. The Indian scouts were Sioux, were sympathetic and are not counted with the troops. Of the cavalrymen, fully one-fifth were raw recruits, scarcely a month with the regiment, having joined at the Agency and many had never fired a rifle. Moreover, four troops were mounted and two others broken up into lines of sentinels; so when the hottest and by far the fiercest fighting took place, the Indians, numbering over one hundred of the hardest characters in the Sioux Nation, were face to face with two dismounted, incomplete troops—probably not over seventy-five men.

The fight was *not* unexpected except to the troops. We learned afterwards that resistance to disarmament was fully determined on during the night; and the warriors took their places before us with arms concealed and a plan for escape in readiness. That they failed in the attempt was not due to weakness but to their fearful losses at the beginning of the fight and the prompt dispositions to head off the herd which they had managed to secure.

The mountain guns were used, not where resistance had ceased, but where resistance was so stubborn and fierce that small-arm fire could not overcome it. It was to put a stop to the deadly and unapproachable fire of concealed Indians that the guns were used on two occasions; and even when "cease firing" had sounded, *resistance had not ceased*. To write that these guns were used "long after resistance had ceased," is to write what never would have been written by Lieut. Richardson if he had consulted those who know.

It is a pity that the author must needs introduce Indian testimony to try to prove the killing of Indian women and children and of their comrades by the troops. If my memory be not as faulty as that of Lieut. Richardson's informant, it was the endless lying of American Horse, whom this officer quotes, which led Agent Royer to misunderstand the situation at the beginning. In matters of this sort, or indeed in matters of any sort, the lying tongue of an Indian is a poor foundation on which to build an accusation of savage cruelty against one's fellow soldiers. The first, close, deadly and tremendous fire of the mass of savages was full at the line of soldiers between them and their village, which swarmed with women and children. Here many of these non-combatants, were killed and wounded and from the very nature of things, by the fire of the Indians themselves. Behind the Indian camp was a ravine and beyond this a line of mounted soldiers. Officers at this point testify that the bullets from this fire, which had to pass through this camp to reach them, fell thickly about them. The fire directed on the herd to drive out the sheltered Indians may have killed or wounded a few non-combatants. *No woman nor child was knowingly injured by soldiers.* It makes me sick to have to deny such a charge. Our soldiers who fought the opening fight, fired through the Indians into our empty camp. The Colonel, Major Whitside, Major Hoff, our senior surgeon, headquarters' staff, interpreters, Father Craft, teamsters, etc., were in line with this fire and their escape was cer-

tainly miraculous. The only explanation is that most of this fire stopped in the bodies of the Indians.

I have sought everywhere for Lieut. Richardson's authority for stating that 185 Indians were killed. This item, a matter of mere numbers, should have been approximately correct, at least.

II.

"The Army: Its Employment During Time of Peace, and the Necessity for its Increase."

First Lieut. W. E. Birkhimer, 3d Artillery.

THE Government of the United States under the Constitution has existed a little over one hundred years. During that period the army has advanced in public consideration from almost nothingness to one of the great pillars of the State. This progress has been gradual, but it has been certain; and this in the face of early predilections unfavorable to a regular military establishment.

The wisdom of those who framed our Constitution has justly been the subject of eulogy. In no single provision of that instrument is this wisdom more clearly evinced than in that relating to the public defense. "Congress shall have power to raise and support armies." That is the emphatic language. There is no limit as to the number or character of the forces. If need be the whole arms-bearing population is placed at the disposal, not of distinct States, but of the national government, for national purposes. It is a provision in every way worthy the prescience of that wonderful man, the impress of whose mind is stamped upon all the great measures of the Constitution—Alexander Hamilton.

It is at once a pleasing, interesting and curious study to follow the growth of the army, under the Constitution, in popular favor. In providing that Congress should have power to raise and support armies the Fathers builded better than they knew; but this remark does not apply to Hamilton: he knew just what it meant in all its amplitude.

When the government of the Confederation ended and that under the Constitution began—1789—there were but a few hundred troops in service. These had, ostensibly, all been raised for protecting the western frontiers. We say "ostensibly," because while this was the reason given out for raising all, yet to those who were in the secrets of government it was known that, as to a portion of the forces, this was not true, and that, in fact, these latter had been raised to suppress an insurrection which had threatened to revolutionize the wealthiest and most powerful State of the Confederation. Moreover it was well known that, in the opinion of the statesmen of that day, the raising of national troops for this purpose was a usurpation of power not warranted by the Articles of Confederation; and only to be justified under the plea of necessity. It was under the shadow of this great danger —rebellion—happily averted, that the Constitutional Convention met. The lesson so recently learned as to the necessity that might arise for a general use of a national military force was still deeply impressed upon the minds of its members. It was a potent cause, as we readily may believe, leading to the insertion in the new charter of government, of the constitutional provision before mentioned.

Nevertheless, at first, the militia, a State force, was looked to as the conservator of peace; while the "armies" of the Constitution were regarded as proper for the prosecution of hostilities against a public enemy. For the latter purpose the experience of the Revolutionary War and of more recent times had shown that militia are unsuited; but, notwithstanding during the Massachusetts insurrection some of the militia had refused to march against the insurgents, and others of them yet confessedly could not be trusted, still they were regarded as the military force which, with peculiar propriety, could be called on

to sustain the civil power in case of need. The use of the army for this purpose was not, at this epoch, viewed with favor.

The first Act passed under the Constitution authorizing the employment of military force to uphold if need be the civil power furnishes evidence of this. Chapter 28, Act approved May 2, 1792, provided that whenever the United States laws should be opposed or their execution obstructed by combinations too powerful to be suppressed by the ordinary national civil authorities, the President was authorized, when so notified by an associate justice or district judge, to call out the militia. No mention was made of the army. The militia alone was to be relied on.

And yet the act contained a curious clause, and one indicating distrust of this force due to local prejudices, for it provided that in case the militia of the State where the unlawful combinations should happen, should refuse to suppress the same, the President might employ the militia from adjacent States for this purpose. This was the law at the time of the Whiskey Rebellion referred to by Major Wilson; and it is a significant fact that, while entrusting the maintenance of peace and the enforcement of law in the last resort to militia, Congress should thus have coupled with the authority a provision which could only imply a want of confidence in the possible efficacy or fidelity of the force thus to be utilized. A weak point in this law, and one based upon the early maudlin theory that the executive authority should wait the bidding of the judiciary before it proceeded to enforce the laws, was that which required a notification from a judge or justice to the President before the latter could act. The experiences of the Whiskey Rebellion clarified the atmosphere in regard to the matter of dealing with insurrections, and the next act—chapter 36, Act Feb. 28, 1795—on the subject, greatly extended the power of the President in such contingencies. It removed the judicial stumbling-block between the President and prompt, efficient action, and authorized the President, in calling out the militia, to communicate directly and at once if need be with the militia officer without regard to the Governor of his State. The militia, however, was the only force authorized. It was contrary to the traditions and still violated the prejudices of the people to use the army in the enforcement of the laws. Visions of the Pretorian Guard conveniently and instantly sprang up when such measures were suggested. Thus it happened that, perhaps insensibly yielding to influences of early teachings which deprecated the use of a regular establishment on such occasions, and not sufficiently examining into the character which necessarily attaches to an army raised under the Constitution, Congress for almost two decades after the adoption of that instrument and the formation of the government under it, could do no better than to trust the vindication, when defied, of its expressed will, not to its own military force, but to that which belonged primarily to the States, and this, too, although Congress did not hesitate to couple with the trust the insinuation that the State forces might not, under all circumstances, prove themselves worthy of confidence.

The first change in this sentiment was expressed in chapter 39, Act approved March 3, 1807. Moreover, the scope of this act was not like that of the preceding ones mentioned, limited to the States, but extended to the Territories as well, and it provided that, in all cases where it was lawful for the President to call forth the militia to quell insurrection or remove obstructions to the laws, it should be lawful for him to employ for the same purposes the land or naval force of the United States.

The circumstances leading immediately to this change of legislation, which also indicated a change of feeling regarding the use of the army, may briefly be recalled with interest and profit. What Aaron Burr hoped to do by the expedition which he led down the Mississippi in 1806 will never be known. He kept the secret in his own breast. But he had the address to allure many honest men into his schemes. The President was greatly worried and so were all patriotic citizens, for danger threatened from abroad, and the re-

mote theatre of Burr's unlawful enterprise greatly enhanced its importance and increased the embarrassment of government in dealing with it. He had tried all the arts of his recognized great talents for intrigue to corrupt officers of the army. It was not known how far he had succeeded. Doubt stalked everywhere in the Councils of the Administration. To the army, however, of necessity, was entrusted the frustration of the plans of the conspirators, because in that distant country from which a month was required to reach the seat of government by mail, the army was the only representatives of law and order capable of arresting the designs of Burr and his associates. When after enforced and painful suspense word came from the scene of action, it was found that the army had proved true to its trust; not one of its numbers had fallen by the wayside, while the would-be law breakers from the chief down were either in custody or scattered to the winds. This circumstance profoundly impressed Mr. Jefferson and all those who were in sympathy with him, and most favorably for the army. It had proved itself worthy of a confidence which, down to that time, he had never reposed in it. From that time on it had his confidence; and it is remarkable that thereafter no exercise of military power that might be found necessary ever exceeded what he would not vindicate.

While Burr's conspiracy brought the trustworthy qualities of the army more conspicuously before the country than any other one circumstance had done, yet in fact it had not unfrequently been used before this to maintain the laws, and always with happiest results. It had enforced Indian treaties and prevented Indian wars by keeping intruders off the reservations or recognized Indian lands; it had aided in the enforcement of quarantine laws, and all under the authorization of express statutes; besides this, without any express warrant of law, but under that broad duty imposed upon him by the Constitution to see that the laws are faithfully executed, President Adams had associated the army with the militia in a demonstration made against breakers of the law in Pennsylvania other than those engaged in the Whiskey Rebellion before referred to. Nor was this all. The embargo laws, as is well known, formed a prominent feature of Jefferson's administration. They permitted, contrary to republican faith in its pristine purity, the military power to be invoked in aid of the civil. But here, owing to local sympathy, it sometimes happened that State governors and the militia were reluctant to enforce the laws against their constituents and neighbors. The regular forces in such cases were placed in requisition; and indeed, to so great an extent was it found necessary at first so to utilize the forces authorized by chapter 43, act approved April 12, 1808, that the Federalists raised a great hue and cry about the liberties of the country being in danger. They knew better, however; it was only returning to the sound practices of the Federalists themselves in the so-styled military days of Mr. Adams, and which at that time were so much deprecated by their opponents—the republicans. Thus by almost imperceptible degrees the army grew into favor; experience showed that it was necessary to and could be entrusted with the maintenance of order; and this conviction having once taken possession of the public mind, the harangues of demagogues regarding the danger to liberty that lies in the keeping up a regular force had long since ceased to impress the substantial, intelligent, property owning portion of the community.

It were useless to trace this particular line of our comments further; and were this not so, space forbids. But we may add that the army has never sacrificed the advantage thus gained; in fact the esteem in which it is held has steadily grown with the growth and strengthened with the strength of the country. One of the most interesting and happy results has been that to-day the army and the judiciary of the United States avowedly stand not in antagonistic attitude, but firmly side by side in the great work of vindicating the majesty of the Government and of the laws. It was not always so. At first the judiciary appeared with considerable unanimity to take it for granted that the regular army

was the embodiment of a despotism which meant defiance of all law. It long since has learned differently. It long since has learned to appreciate the fact that the army, by methods of its own sought to attain, by means within the law, the same great ends with the judiciary itself. Since then these two governmental agencies have been friends; and it is observed with peculiar pleasure that when causes involving military questions are taken before it, the army view is almost invariably taken by the Supreme Court of the United States.

All this was not without a cause. In the early days, and down through the War of 1812, the army may be said to have advanced in public favor through its sturdy honesty of purpose and faithfulness to trust. The personnel, officers and men, were brave to a fault. There was, however, one difficulty in the system—deficiency of proper educational facilities. Both Presidents Washington and Jefferson understood this, the former regarding the matter from the standpoint of a practical soldier, the latter as a statesmen; and, due to their joint efforts, measures were put into operation to meet this deficiency. We say this, because, although Mr. Jefferson at first opposed the project of the Military Academy, he afterwards, when President, lent all his powerful influence first to its establishment and then to its maintenance. He saw with perfect clearness of vision that education, industry and professional research were absolutely necessary to get the best work out of soldiers.

Like all great measures of true amelioration, the educational progress of the army was slow; but, resting on a firm basis, it was sure. In the course of years it began to tell; and it safely may be asserted that, by 1821, the advantages of the Military Academy were manifest, were generally and cheerfully acknowledged. No one understood this better than Congress, particularly the Senate, whose numbers changed less frequently than those of the House. These gentlemen now recognized the fact that when they met army officers they were conversing not only with brave, but educated men, and that this education, far from rendering these officers effeminate, as in times past was ignorantly supposed, rendered them more valuable in every way, as now they not only knew what they wanted but why they wanted it, and how the sought for end could be attained. The lights of science had supplanted the rule of thumb. The services of graduated cadets were eagerly sought not in the army only, but out of it. Thus a broad, deep and abiding foundation was laid in the respect and confidence of Congress, which gave appropriations for the army, and of the people from whose ranks the officers were drawn. And although not all of the latter were or are graduates, still, in years, the influence of education in establishing precedents, customs and rules of services has imparted a unity and system which for a long time has dominated and given tone to the military establishment. Thus while all officers were and are not graduates, all without exception in greater or less degree, either directly or indirectly, have reaped and will continue to reap the benefits to be derived from those enlightened views of public policy which practically were put in operation by the establishment of the Military Academy.

One of the most striking changes in our army wrought in recent years has been in the character of the enlisted personnel. This results principally from the different method of recruiting adopted in latter times. We have ceased to draw recruits mostly from the larger cities, and have gone into the country for a very large percentage if not a majority of them. The result is that the people generally are beginning to know more about the army than ever before. This means they appreciate it more than formerly. There can be no doubt but that this country recruiting system is calculated to popularize the army with the people. Whether or not it has given us men who make better soldiers than those enlisted under former practices is very doubtful.

A great mistake made in recent years has been in reducing the term of service to three

years. The former term, five years, has been whittled down by circumstances growing out of ill-advised empirical laws, rather than from well digested considerations. We have had the three-year term more than once before for the regular army, and then abandoned it. Our term of service ought to be a standard for volunteers when war breaks out. It is believed that, if we take patriotic sentiment at the flood, in the first excitement attending hostilities, we could get very many thousand volunteers for a five-years' term. The chances are that these men will see the war not only begin but end. What an immense advantage this would be! Yet we will sacrifice all chance of it if we keep our regular term of enlistment at three years, because we cannot in reason ask volunteers to enlist for a longer term than we habitually enlist our regulars. Although the three-year term of enlistment was the result, without system, of the numerous laws just referred to, yet the vital consideration at the bottom of all was so to adjust the term of years as to induce men not to desert. A far better plan would have been to keep our five-year term, and punish deserters as they deserved, and not grant them immunity from punishment as we practically now have done. Besides, we now find ourselves, for the pitiful consideration of placating the most unworthy part of our army, depriving ourselves of the means of obtaining, should we be forced into an important war, volunteers for a term of service sufficiently long to carry us safely through it.

Major Wilson refers to the association together of regular troops and militia as being mutually beneficial. Properly conducted it is believed that much good might flow from such joint services. But to this end each must work faithfully. We have known such occasions to be turned by the militia into howling farces. From such associations no possible good military results in the way of manœuvres can be expected. The very recent act of Congress throwing open certain military parks to joint occupation of regulars and militia is in line with this idea. The regular army owes to itself the duty on all such occasions to set the very best example in every respect to the militia that circumstances permit. This will generally be found in paying the most painstaking attention to the exact performance of military details. But on no account should the erroneous idea get foothold that these militia organizations are those which the national government will have to depend upon to fight her battles in an important war. They are not intended for, nor can they be relied on for such purpose. While many of the militia personnel will go into the United States volunteers that will be raised when war breaks out, and, in this view the training and experience they have had in the militia may, it is hoped, prove beneficial, these militia organizations as such will not be found either in line of battle or marching if need be into foreign lands to uphold the honor of the flag. The militia are State troops; their term of service under National authority is limited by law, and is very brief, totally inadequate to the purposes of war; the right to demand their services at any time is one that State executives have insisted upon judging of equally with the President. When war is precipitated upon the United States, the Government should at once proceed to obtain all soldiers who will enlist for a long term. The least should be for three years, the maximum limit for the war. Moreover, these men perfectly understand when they enlist that they are doing so not for holiday parade, but for purposes of fighting. Again, they know that they are liable to be taken anywhere that fighting may be needed, even to the most distant point of the globe and in foreign lands. They are not men to be afflicted with conscientious and constitutional scruples when the enemy is in sight across the border. The training of militia in time of peace is of use for national purposes only to the extent that it fits them for long-service volunteers in time of war. The national government long since ceased, and with reason, to place any dependence upon militia as such for battle purposes; and more particularly for protracted campaigning.

We heartily endorse Major Wilson's views as to the necessity of maintaining strict

discipline in our army. He puts this matter fairly and pointedly. We are glad he mentions the subject because we have had occasion to observe with regret in recent years the view expressed that somehow or other our military discipline was to be of a milder, less rigid kind than exists in other armies or than formerly characterized our own. We believe this is rank heresy. So long as such expressions are but the airing of the vagaries of certain military theorists, they do no special harm; but when officers in command of and in daily contact with troops give utterance to such sentiments, the inevitable effect, to the extent of their influence, must be demoralizing. Unfortunately, a few years ago there was installed high in authority in the military system a gentleman, well meaning and conscientious, but wholly misguided, who entertained these humanitarian, philanthropic, and so-called reform ideas; the shock he gave the military system in enforcing these views was such that, notwithstanding his incumbency in power was brief, the army has scarcely now recovered from the effects of it. It is more than doubtful whether the law enabling the President to limit punishments in certain cases has proved beneficial. The abuses that have arisen from it are well known to officers who serve with troops Strict discipline does not mean tyranny. It means the requiring every one to do his duty punctually and well, in consonance with and conformity to law, regulations, and the lawful orders of military superiors. It consists more than anything else in a strict attention to the details of routine every-day service. It does not mean one rule of conduct for the officer an l another for the enlisted man; it demands that all, and impartially, shall meet fully the requirements of constituted authority; and, as the officers are the instructors, so they should be the exemplars in all matters of military propriety and excellence. Let this be the rule of action at a post and in an army and there will be found no difficulty in disciplining the enlisted men. At the same time, any, the least, familiarity between officers and men is not to be tolerated for an instant; nothing could so quickly give the men contempt for their officers; nothing gives authority a so fatal stab, or forfeits the respect that the enlisted man takes pride in entertaining for those in commission above him. As Major Wilson truly says, there is, because of the character of our government and the constitution of society with us, more necessity for an inflexible observance of this principle in our army than in many others of governments less popular in form. This fact was pointed out upwards of fifty years ago in a clear, incisive speech by Mr. Hayne, of South Carolina, in the United States Senate. He put to sleep, let us hope forever, the project favored by some legislators of speculative minds, to have enlisted men, in some cases, sit with officers as members of courts-martial.

Major Wilson believes that, first of all, under existing conditions the artillery should be increased. We agree with him, and at the same time, as interested motives may be alleged, will not enlarge upon the subject, particularly as the question seems to be safe in the hands of impartial men. At the same time a curious phase of the matter has been brought annually of late to the attention of the army. All will recall that a few years since a newly installed army commander, in his first annual report, dwelt with characteristic vigor of language upon the defenselessness of our coast; the rapid strides made in recent years in death- and destructive-dealing engines and missiles of war, all operating to place our maritime cities more than ever before at the mercy of a hostile naval power; of the great disparity between our organized and trained force of sea-coast defenders and those that would be requisite if war with a powerful enemy should befall us, as might be the case any day, and then the somewhat surprising conclusion drawn from this array of facts and line of argument, all of which tended to emphasize the necessity for a better defense of our sea-coast frontier—that the cavalry should be nurtured. Again in more recent years we have seen the same array of facts and course of reasoning resorted to by even higher authority, reinforced by other facts which science and art have developed in

the line of sea-coast armaments and powers to destroy the same, all giving cumulative proof of the necessity for more sea-coast defenders—and with the slightly varied but no less curious conclusion drawn from it all that the pressing demand of the hour for us is the three-battalion organization for the infantry. We are glad to see that Major Wilson in this regard is wholly consistent. His line of argument, based on the same conditions and array of facts, leads to the inevitable conclusion that our vulnerable point to-day is our sea-coast-armament and defenders; and he concludes, logically, that both should be increased and at once.

Let not these remarks be interpreted as attempted disparagement of the other arms of the line. Nothing could induce us to utter one word that could have such interpretation. The cavalry—bless them—can take care of themselves; they have always done so, and we believe always will. As to our gallant infantry, it is impossible to speak of it in those terms of affection and esteem which the heart prompts. We have served with it both in peace and war and know it and what it is made of. And to-day, outside of the double-row of artillery first lieutenants, the army presents no sadder sight of hope deferred than in the stagnation to promotion present and prospective of captains of infantry. This condition of affairs is neither creditable to the Government whose servants for life the officers are, nor conducive to military discipline or efficiency, and should be put a stop to. There is one principle of organization that should never be violated in arranging our military establishment, namely: that the relative number in the various grades should be such that, due to casualties of service, in ordinary times, officers should have secured to them a reasonable flow of promotion. If this principle be lost sight of, just to that extent the efficiency of the military system will be impaired. We see the happy effects of its observance illustrated in nearly all branches of our staff. For this cause alone there should be a change wrought in the organization of our infantry. The important question is how this best can be effected. The favorite plan is the well known three-battalion twelve company regimental organization. We hope the infantry will get this; we shall do all we can, little, as it is, to assist, and we have faith that ultimately they will secure it. While we say this, we do not wish to be misunderstood. We favor that organization simply and solely because it will secure to the infantry that flow of promotion which it should have under the principle before enunciated, and for no other reason whatsoever. We are aware that this is not orthodox under the generally received dispensation. We are familiar with the essays that have been written and the Congressional and other reports made to show that upon tactical principles the hoped-for organization is a military necessity. We believe that this is not true. A few years ago we had a board evolve a system of three-battalion drill regulations from their inner consciousness pieced out by the varied drill systems of Europe. Yet the printer's ink was not dry in the copies which we generously were permitted to purchase before we were informed by officers high in authority that many of the supposed indispensable principles had already been discarded by the armies whence they were borrowed. This was confirmed by the publications from abroad of our own infant military information bureau. Moreover, upon trial, many of our officers who took the trouble to think for themselves and to follow principles to their ultimate effects, came to the same conclusion regarding the inapplicability of many things taught in the drill regulations to our military system existing or hoped for. The result of it all is that one of our three major generals is now engaged in the task of giving us another copy of regulations, to what extent differing from its predecessor we have no means of knowing.

Again, there is no charm, although there does seem to be a spell connected with the figure three when we come to selecting the number of battalions a regiment should have. And if we are to take German methods for instance simply because they are German, why do we not pursue the subject to the end. Why do we not take their large companies

with few officers? The fact is, it never, to our knowledge, has been demonstrated that regiments with a less number of companies than twelve cannot be handled with ease and effectiveness on the battle-field; and handled there to meet, out-manœuvre and overcome any rival organization opposed to it.

The three-battalion twelve company regiment not being therefore a tactical necessity, we are at liberty to consider objections to it, come from what source they may. One of the strongest objections arises out of the character of the regimental commanders who, in a very great, indeed, preponderating degree, will lead our volunteer regiments in time of a war, such, for instance, as that in which we may become involved with England over the Venezuelan or other kindred contentions. We have already discussed this matter in our remarks following the reading of a paper on infantry tactical formations by Lieutenant, now Captain, Edward J. McClernand, 2d Cavalry, before the Branch of the Military Service Institution at Vancouver Barracks several years ago.* We will not now repeat what was then said. The gist of the argument was that, because of the political complexion affairs wear with us, and which is heightened when war intervenes, colonelcies of volunteer regiments will be very generally conferred, not for recognized military qualities, but for political services; that these colonels instead of having large regiments which in their hands will necessarily be unwieldy, should have only small ones, better suited to their capacity: consequently, while our regular officers are capable of handling the larger command, the part of wisdom would seem to be attained by that kind of infantry regimental organization which alone is adapted to the capacities in general of these regimental commanders whose services the Government must accept in time of war. In this course of reasoning we follow the path marked by the lights of experience from 1775 to this time. It is also predicated upon the further assumption, based on experience, that in any great war United States volunteers will be the principal force involved.

That is a wise policy which secures the dissemination of correct military ideas throughout the masses of the people. For this reason, if pains be taken to conduct them properly, the joining of regulars and militia, before adverted to, will prove mutually beneficial to all concerned. Sending officers to schools to give youth military instruction is an excellent plan. But the question arises, should they not be confined to military instruction? Does it meet the ends of Government, in sending the officer, unless he confine himself to his military duties strictly? And in connection with this subject of disseminating correct military knowledge, would it not be well to depart from our traditional practices and work the Military Academy up to its limit of accommodation for cadets, sending those graduates for whom places cannot be supplied as army officers, back to the paths of civil life whence they came but four years before, and where the exact military knowledge they have acquired may be of greatest possible use. As our country expands in resources, its military needs expand at equal pace. The capacity to turn out more cadets at West Point than now is done is certain. It is worthy of careful consideration whether public interests will not soon, even if they do not now, demand that this capacity be utilized to the utmost.

* JOURNAL M. S. I. Vol. XI, p 509—No. 45.

Reviews and Exchanges.

New York City and Vicinity in the War of 1812-15.

IN his second volume* Mr. Guernsey brings to a conclusion his graphic account of the condition of a city, which no New Yorker of the present day would recognize as his own, during a maritime war equally unknown to our modern experience. Nothing escapes his search, and many are the strange items unearthed. For example, what would be thought now of the following notice which appeared in 1814 during the local panic that immediately preceded the capture of Washington.

"*To the Tammany Society or Columbian, Order.*

"Brothers: The voice of patriotism calls you to the service of your country. Prepare yourselves with zeal and promptitude to obey that loud summons. Your Committee have pledged themselves to the Committee of Defense that one thousand of our society shall, on Wednesday the 31st, appear on Brooklyn Heights to aid in erecting the fortifications intended to defend our city against the menaced assaults of a ferocious and brutal foe. Redeem that pledge as becomes freemen! You are requested to meet on Wednesday next at five o'clock at Tammany Hall, for the purpose of proceeding to Brooklyn."

Nor was the excitement confined to the male sex. "A company of ladies from New York City went to Brooklyn, and forming a procession at the ferry, led by the music of Tammany Society, increased in numbers as they went to Fort Greene to between two hundred and three hundred, where they performed an hour's work on the fortifications amid the plaudits of the citizens on the ground. Several patriots of the Revolution were among them, and a lady seventy-two years of age wheeled a barrow of earth with great activity."

The above notice appeared on August 25th. On August 27th the Columbian contained the following:

"TO ARMS! CITIZENS, TO ARMS!

"Your capital is taken! 13,000 British troops may have marched for Baltimore, and before this hour it may have fallen. Six days ago the people at Washington were in perfect security. In six days the same enemy may be at the Hook, and if they assail your city with a powerful force by land and by water, what will be your fate? Arise from your slumbers! Let every citizen arise and enroll himself instantly and prepare to defend our city to the last extremity! This is no time to talk! We must act, and act with vigor, or we are lost."

At that date the defenses of the city were sufficiently strong to cause the British admiral to abandon his plan of attack on New York, after lying off the Hook for several days, and to transfer his operations to southern waters. Are we quite sure that under like circumstances the city would be equally fortunate to-day?

The readers of the JOURNAL will find many details of interest concerning the fortifications of that period, which are little known and not easy of access. The bitter experience of the city during the Revolution was still fresh in mind, and prior to the outbreak of hostilities considerable progress had been made by State efforts. A full report was made

* *New York City During War 1812.* Guernsey. Vol. 2, 1885.

by the Secretary of War in 1794, covering a project by Charles Vincent, a French engineer. His plans contemplated fortifications at "Sandy Hook Point, the Highlands of Navesink, on Staten Island at the Narrows, and on Hendrick's Reef, and, where Fort Hamilton now is, to cover Fort Lafayette—then Governor's Island, Bedloe's and Ellis' Islands, Powles' Hook (the southeast point of Jersey City), Jersey City Heights, the South Battery (Castle Garden), and the Fort off Hubert Street. No notice was taken or suggestion made as to defenses on points of East River or at Harlem." In the same year an appropriation of $100,000 was made by the State for the defense of the City. In 1799 Congress authorized the States to discharge their debts to the general government by expending a like amount, within five years, for fortifications within their own boundaries; and New York expended about $900,000 in this manner, under the supervision of the general government. Works on Governor's Island, Bedloe's Island, Ellis' Island, and Castle Garden and "the Red Fort" off Hubert Street were thus built.

In 1807 work was more systematically undertaken, and at the outbreak of the war good progress had been made on fortifications, chiefly designed by Colonel Jonathan Williams, Corps of Engineers. The total armament in position consisted of the following guns and mortars. Others were in depot.

Fort Columbus	60	pieces.
Castle Williams	78	"
Bedloe's Island	24	"
Ellis' Island	18	"
Castle Clinton	28	"
North Battery (Hubert)	16	"
Staten Island Forts	60	"
Total	284	"

During the year 1812 work was pushed forward with vigor. A large fort on Navesink Highlands, mounting 32 pdrs. and garrisoned by eight companies, was reported as completed on March 1, 1813. It was named Fort Gates. Sandy Hook was much less advanced than at present. The lighthouse, 85 feet high, was at its then northern extremity; and a few guns were placed near by, to keep off marauders and to signal the approach of the enemy. In November, 1812, "White Fort" or Fort Gansevoort was completed. It projected into the river near the foot of the present street of that name; and was built of Newark red sandstone, hammered and whitewashed. It had embrasures for 22 cannon Earthworks similar to those of the Revolution were constructed at the Battery, eastward from Castle Garden, with bastions to sweep the water approaches.

Prior to this period no works existed on the Long Island side of the Narrows. On November 6, 1812, the State deeded Hendrick's Reef, covering about 30 acres submerged three feet at low water, to the United States for defensive works; and on March 15, 1813, the foundations of what is now Fort Lafayette were reported as completed. In the autumn of 1814 it could mount 73 guns, in three tiers. The site of Fort Hamilton, consisting of about 63 acres, was purchased from William Denyse for $8875, on April 22, 1814; and at about the same date an additional tract of about an acre from Jacques Cortelyou. In the light of recent expenditures a much larger purchase in this vicinity would have been judicious.

To cover the East River approach, a work, Fort Stevens, was begun at Hallet's Point, and shortly after a tower in rear to cover it; also a block house on Mill Rock in Hell Gate. It was however suggested that a battery for eight or ten Columbiads was necessary at some proper place between Throgg's Neck and Blackwell's Island.

The works for land defense were extensive. Beginning at Mount Alto on the Hudson

near 123d Street the line of the Harlem was held to Hell Gate. Continuing on the Long Island side, a system of earthworks completely enclosed the peninsula on which the village of Brooklyn was situated, extending to Gowanus Creek. Various block houses and forts were distributed in advance to cover points where landings were anticipated.

In this age of long range guns it is hard to believe that only eighty years have passed since such a system of defense was approved by the ablest engineers of the day; but it should be remembered that New York City hardly extended to Canal Street on the west side, and only to Houston Street on the east. The painstaking labors of Mr. Guernsey have opened a land of enchantment to the lovers of the early history of the Union in these States. H. L. A.

The Fifth Army Corps.*

Possibly it was Jerrold who regretted that a wife did not resemble a bank bill of forty dollars, which can be so readily exchanged for two of twenty.

Nothing like such an aspiration has ever occurred to us, but we do much prefer two small octavos in the place of one so generous in its proportions as the present volume of nine hundred pages. These are not bedside books by any manner of means, and when gravitation has got in some twenty minutes' work the reader is fain to fall back upon such supports as he can build out of knees, tables, and footrests.

This history is thoroughly well indexed, but the map material is limited and incomplete. Any place or road or stream that deserves particular mention in the text is equally well entitled to place in the sketch that professes to illustrate the text, and the repeated absence of such localities in the detail and nomenclature of the few maps furnished, if not noticed by readers to whom the ground is familiar, creates difficulties for the large majority.

On the roll of the generals commanding the 5th Army Corps are such names as Fitz John Porter, Hooker, Butterfield, Meade, Sykes, Warren and Griffin; and its list of decisive events in the Great Rebellion begins with Gaines' Mills, and closes at Five Forks, including all the famous fields that lie between the Susquehanna and the Appomattox.

"What more can we tell," says Colonel Powell. "The gallant old Corps which had alone withstood the shock of Lee's army at Gaines' Mill, which saved Round Top at the turning point of the war, now in the fields of the McLean House, on the morning of the 12th of April, 1865—the anniversary of the day upon which the first gun was fired at Fort Sumter—found itself the last to look upon the disintegrated remnants of the Army of Northern Virginia, whose folded colors had been laid at its feet."

For to the 1st Division had been delegated the honor of receiving the surrender, and General Chamberlain had been designated to command the parade.

It was in the person of this officer too that the Fifth Corps received the tribute of a direct promotion on the field, "the only case of the kind on record during the war," says Colonel Powell.

The further fact may be noted that if idly turning over the leaves of an American encyclopædia, the reader's attention might well be aroused by the entry that a professor went into the war of '61 from Bowdoin College, was in twenty-four pitched battles, was six times wounded, attained the rank of major general and in 1865 resumed his college professorship. But he would feel no sort of surprise to learn that the professor subsequently became president of the college and Governor of the State.

On the Confederate side there were quite as marked and abrupt translations. They serve to show who went to the war and why they went.

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* *The Fifth Army Corps.* By William H. Powell, Lieut.-Col. 11th Infantry, U. S. Army. G. P Putnam's Sons, New York.

When desks and pulpits are abandoned for drill fields and battle grounds, there is something more at stake than opium markets and scientific frontiers.

To the 5th Corps also belonged the 12th New York, the first Union regiment to cross the Potomac, under General Butterfield as its colonel, subsequently chief of staff to Hooker.

And the Corps was especially fortunate in its Adjutant-General, Locke, who remained in that position throughout the war. "Colonel," a Pennsylvania captain is quoted as saying to him, having occupied a period of camp leisure with Victor Hugo's book, "Colonel, *Les Miserables* is a hefty thing to handle, isn't it?"

"Well," replied Locke, "if all the Pennsylvanians stand up to their work as well as your men, we shall not find *Lee's Mizerables* quite so hefty to handle hereafter."

Not many Adjutant Generals would have twisted a compliment out of a colloquialism in that felicitous fashion.

This Corps too, had its "Regular Brigade."

"Around the standard of these old regiments were clustered all the traditions of the country's wars, a sacred trust they guarded well on every field."

These were originally portions of the 2d, 3d, 4th, 6th, and 10th U. S. Infantry, and battalions of the newly organized 11th, 12th, 14th, and 17th regiments.

And with this Corps was connected the Artillery Reserve under General Hunt, of whose "lifetime of thorough devotion and brilliant service" Colonel Powell makes appropriate mention.

There is no need to dwell upon the record of the Artillery in the Civil War. Its duties were discharged and its history made along the lines laid down by General Hunt and after his example—and with his reward.

McClellan's position upon the Chickahominy became untenable after the retention of McDowell's Corps to cover the anxieties of Cabinet, Congress, and whatever else of interference was focussed at Washington.

Straddling that river, based upon the York to the eastward, and unable to extend himself so as to securely hold the Fredericksburg-Richmond line to the west, McClellan availed himself of an alternative that seems to have been quite as disagreeable and unexpected to General Lee as anybody, and withdrew to the James in what has always appeared to us a very timely and creditable manœuvre.

But, at the time, it brought him little credit and no rest, and it is a matter of regret that if he magnified the enemy in front, he failed to make a necessary and just estimate of certain other and mainly political considerations that could not be kept out of the problem, and which a Soldier of the Republic can seldom afford to neglect.

McClellan was not in position to ignore the fears and demands that were potent at the Capitol. Had he conciliated these until his own decided success had lifted him out of their reach, it would have been better strategy and wiser management. He was not to blame for the southerly predilections of the Virginia rivers, nor because the Blue Ridge stretches into Maryland, fencing a highway straight to the north of all that Washington then stood for; but the partialities and antipathies, policies and schemes of the party and people in power have as strong a pull upon campaigns as geography, and are easier tolerated than antagonized, more safely avoided than opposed—and too often cultivated for the return they afford. No victory is catalogued to the credit of McDowell, yet he became and remained a major general in the U. S. Army. Defeat and disaster of the most inexorable sort were the portion of Burnside, from the fatal delay at Antietam to the slaughter of Fredericksburg, and yet he died in the odor of sanctity.

Fort Lafayette and courts-martial were thought none too hard for less of failure and misfortune than fell upon these two men, for instance, and the soldier of to-day might as

well spend a little time upon the reason for these anomalies as upon Hannibal and Alexander. The steward of Scripture may have been an unjust man, but he was wise for a day and generation 1800 years older than his own. The peculiar histories of the 5th Corps contain a great deal of information in this respect, much of which Colonel Powell furnishes, and some of which is still due.

In the matter of Antietam, we note that it is thought McClellan would have done well had he ventured upon an appendix to that battle the next day, of which it certainly stood in need.

Not to take the chances was an error which a bit or so of Cedar Creek enterprise would have remedied. That most unmistakable of all indications, the sentiment of the men in the ranks, would have supported the general had he gone forward.

Whether or not, to the same extent, this was the case at Gettysburg may be doubted. Shoes, blankets and rations excuse delay, even if they do not authorize it, but these things sometimes are found sooner in front than in rear. Too much should not be expected of the Q. M. Department.

In the case of General Porter the most satisfactory portion of the whole business is the conclusion of the Board, in which "soldiers of integrity and high standing like Schofield, Terry and Getty, lavished honor where only condemnation had obtained."

The Board found in fact that "General Porter was condemned for not taking part in his own battle, * * * and was pronounced guilty of the most shameful crime known among soldiers. We believe," they say, "we believe not one among all the gallant men on that field was less deserving of such condemnation than he."

And no other belief, to one who has knowledge of all the facts, has any element of truth in it. And if, as Colonel Powell states, General Porter's vindication was reached only through the action of a Democratic President and by Democratic votes, all the more honor to the President and the votes, by which an act of justice so simple and long delayed was finally secured. They never could have been better employed.

With what a wavering touch the key to the second Bull Run complication was sought for is indicated in the different objectives so rapidly urged upon General Porter's command, among which were Warrenton, Warrenton Junction, Bristol Station, Centreville, Gainsville, Groveton, where at last it began to be understood that neither Lee nor Jackson were worrying themselves about a retreat.

We have neither time nor inclination to dwell upon the Fredericksburg failure, except to note that the weather must have been wintry when "two men of the 20th Maine were frozen to death," as on the night of the 6th-7th of December.

The celebrated pontoons, which have sometimes been saddled with responsibility for the delay and subsequent butt at Marye's Heights, also appear to be entitled to an honorable discharge in this most curious resolution to get on the wrong side of the river.

Then came the mud march and G. O. 8, and another commander for the Army of the Potomac, who straightway proceeds to get it into chancery in spite of an excellent beginning, because he too persuades himself that Lee is in retreat, and Hooker waits and orders Sedgewick "to pursue the enemy."

McClellan's delusion that he was confronted by 200,000 men was certainly less calamitous, if more perplexing, than this fancy, born perhaps of hope and champagne, that such fraction of the 200,000 as did exist at Chancellorsville was mostly thinking of how to run away.

Here again, as at Groveton, the field and its possibilities seem to be too large for the grasp of the general, and in the terrible game of "Follow my leader," the Army of the Potomac passes over to its sixth and last chief, George G. Meade.

Not one merely, but brigade after brigade, division after division, they still moved forward under the last as under the first.

"Theirs not to make reply,
Theirs not to reason why,
Theirs but to do and die,"
Six—or six hundred.

At Gettysburg "the conflict of July second came to an end with the Federal troops beaten back to the line the 3d Corps had been ordered to hold in the morning, in the words of General Newton, 'hammered into a good position,' with the key to the field held in the steady grasp of the 5th Corps." So says its historian, and over the foresight and efficiency of General Warren that day there can be no dispute.

Of the 2d Corps Colonel Powell adds "these well tried and fully tested veterans covered themselves with glory" and there is full recognition of the service rendered by the cavalry corps with its "magnificent divisions under those daring and competent commanders, Buford, Gregg, and Kilpatrick."

After all, the raids of the Confederate cavalry, famous as they were and wide as was the alarm of their creation, seem rather a handsome advertisement of Stuart and his men than any contribution of real value to the result. Far less conspicuous but more fruitful is the drudgery of outpost and observation duty in direct and continuous relation with the main body. Cavalry are the eyes of the army and may sometimes become spectacles, but at the usual risk of disappearing when most wanted.

One look at the map of Gettysburg with the Round Tops in the angle between Plum Run and Rock Creek should be enough to satisfy any one where the Union lines belonged —but the wheat fields and the peach orchards are the richer for the mistake.

Colonel Powell finds room too for a notice of the Medical Corps, though "words are too feeble to express the praise" its members deserve. And their names, in a roll too long to repeat, are treasured in the memory of the living.

Once south of the Potomac, General Meade was desirous of moving by the left, but to Fredericksburg Heights instead of Falmouth. He does not, however, appear to have been left to his own devices. The army was still tied to Washington and under the control of the various offices on the Avenue.

The failure at Mine Run is explained by General Warren's revision of his original views as to the practicability of attack in his front. Perhaps this was the volt that inspired General Sheridan's abrupt reply to Warren at a later time, "I don't reconsider my determinations," as to which, and all growing out of that same, it may be said that determinations are an excellent thing to have and act on for the moment. But their reconsideration when time permits and opportunity offers is a more excellent thing. Like eggs, they are best when fresh, but become rotten if kept too long and too closely. The very facts on which they are based are modified in the light of new facts, or even from new points of view, and it is a very limited landscape that any determination can take into account; the more limited, the stronger the determination, generally. The most consistent thing we know of is a ramrod—also by itself the most useless. Life and growth involve change.

Finally General Grant assumed the direction of the Army of the Potomac. As Colonel Powell says, he took it, with many interruptions by the way, back to the James River, exactly where McClellan left it.

But there is this difference, Grant took Lee and his army along with him, and he never let go.

The Confederates, it is true, resumed their usual offensive return by way of the Shenandoah, but the firm of Banks, Fremont, Hunter, Sigel, McDowell & Co. had been dis-

solved. There was now one head in control and that head was on Sheridan's shoulders. General Grant says in his Memoirs, "I had drawn up a plan of campaign which I had brought with me, but seeing that he was so clear and positive in his views and so confident of success, I said nothing about this and did not take it out of my pocket." A testimony to Sheridan and to Grant himself, the like of which is seldom to be found in military records.

The end came, and all who read the story of the 5th Corps will regret the more strongly the oftener they read it that the "determination" could not have been reconsidered by which General Warren lost the deserved reward of four years faithful labor, and was sent back in unmerited disgrace to City Point, while his fortunate comrades went forward to the final triumph of the long-suffering Army of the Potomac.

But in this exile of Warren both General Meade and Grant seem to have acquiesed—in fact, the possibility of it seems to have been assumed. We are unable to admit its justice, for such were the time and place that no worse fate could befall any man. He may not, like Sheridan, have ridden into the enemy's intrenchments with Ayres, but he rode with Crawford, and in the charge his horse was shot "within a few paces of the line where the Confederates made their last stand." And Colonel Powell continues—"Warren was now afoot, and had the bullet which pierced his horse pierced the heart of the man, it would have been a trifle to the missile which pierced his brain an hour later." Well, we have forgotten. Does he not figure among the statuary at Gettysburg, looking out on the field he there also helped to win, silent enough now?

The history of the 5th Corps only teaches the old lesson, slowly enough learned, that least of all is the general made by inspiration. Here, as always, first the blade, then the ear, then the full corn in the ear. But education by experience involves mistakes.

In the Army of Northern Virginia there was far more stability of command, and this showed itself in greater freedom of movement. The Confederate divisions kept touch over long distances, through the natural reliance of their chiefs upon one another, and their knowledge of and familiarity with the purpose and methods and resources of the single head which for so large a part of the time planned and directed their operations.

This is everywhere illustrated by Jackson's work. The apparent carelessness with which he disconnects himself from the main body, breaks through Pope's line of communication, captures and destroys the Federal supplies, and then takes position so that his ranks can be fed and his flank extended by the reinforcements that poured through Thoroughfare Gap, as he knew they would, while his adversary was hurrying his tired troops to and fro in a vain effort to locate the invasion and divine its object, shows what confidence begot of "long tried and thoroughly tested" service can effect; while the blunders and confusion of the troops opposed, newly brought together and uncertain of their ground, kept in a whirl of perpetually shifting conditions and instructions, ultimately resolving itself into suspicion and protest and reclamations are equally instructive.

A farmer does not haul his produce to market with unbroken steers, or if he does he finds himself wrecked on the road, all the sooner if the driving is done by all the family. And not the least among the wonderful things in the story of the Army of the Potomac is the way in which they so often found themselves compelled to reorganize within sound of the enemy's guns under the long succession of chiefs that led them to battle, though in their front they were constantly to find Lee, Longstreet and Ewell, Hill, Jackson and Stuart while life lasted.

H. W. C.

Our Coast Defense.

The paper on Our Coast Defense, by Lieut. James A. Frye, of the Massachusetts Volunteer Militia, continues to appear in *The Bostonian*, and, as I am informed, will run through the summer issues. In the May number once more he takes up our cause against

the unfriendly and conservative press and further presents many matters of general interest. There are numerous illustrations of ships of war, not directly referred to, but which keep before the reader the nature and power of the attack to which coast defenses might be subjected. The following is a summary of this chapter:

How national peace has been kept; awakening of the people to our weakness; requisites in coast defense; rapid fire guns on shore and afloat and their present scarcity; torpedo protection uncertain; value of mines; method of employment; control of mine fields; need of other defenses; the search light afloat and ashore; pneumatic torpedo gun; uselessness of untried military inventions; time necessary to construct defenses; cost per capita of adequate defenses.

There is nothing in the literary form of these papers nor in the logical presentation of the arguments and facts which is open to criticism. We might indeed demur at the division of rapid fire guns into "rapid firers" and "quick firers," a classification not recognized in our service, the latter term being an English one for rapid fire guns of all calibres. Lieutenant Frye points out the high place of these guns in schemes for harbor defense, which calls to mind the scant attention they have received in the work thus far. Their tactical disposition is a serious problem, scarcely solved by placing them immediately in front of heavy gun emplacements—the natural target of an enemy. We recognize in the illustrations of torpedoes our ancient friend, "Tidball's Manual," and the obsolete forms shown may be taken as artless testimony to the successful secrecy, in this country at least, of our Engineers' torpedo lore. However, they were not needed for the illumination of the text, which is clear and convincing and gives a proper subordinate place to submarine mines.

The popular comfort in the thought of our unfailing inventive faculty to meet emergencies is vigorously dispelled. The folly of dependence on wild and untried schemes for destroying enemies is seasonably illustrated by T. L. Sturtevant's "System of Harbor Defense," described in the last issue of the *Journal of the U. S. Artillery;* while hopes founded on our supposed exhaustless powers of invention might receive a rude shock by the contemplation of our seeming inability to produce a disappearing carriage for the 12-inch high-power rifle, designed and built six years ago.

The June number contains ten handsome photographs of vessels of our new navy, while the text is devoted to the almost resultless efforts to arouse Congress into action for national defense; a comparative analysis of naval forces; and the proper rôle of naval forces in their relation to defended harbors. In this discussion of comparative costs of floating and shore defenses, the figures given in the case of forts are for emplacements only and do not include guns nor power to move them, and for the ships, the cost of hulls and machinery only is considered. I take this occasion to correct certain figures in the cost of fortifications, which I am able to do through the kindness of Lieut. MacGregor, C. E. The emplacement for one 10-inch gun actually constructed at Fort Hamilton cost $49,000, making this item for New York harbor $980,000, instead of $700,000, as given in the table quoted by Lieut. Frye. This change, however, does not affect the cost ratio of three to one.

The tone of the writer of these excellent papers in his discussion of the coast defense problem is wholesome and fair. He is in a position to be free from the blindness of professional enthusiasm, while the wide range of his authorities gives an undoubted value to his conclusions. The June number in particular is good reading for any genuine, thoughtful American.

H. L. HAWTHORNE,
1st Lieut., 1st Artillery.

An Elementary Veterinary Manual.*

This little English work is intended, as the author states in the preface, for the use of officers attending courses of instruction at the Army Veterinary School at Aldershot, and the corresponding courses at Simla and Poona. In it an outline is given of the more common diseases and injuries among horses,—their causes, symptoms, and treatment, closing with a chapter on medicines and remedies.

Throughout the book, the author has very wisely avoided technical expressions, and has succeeded in putting in concise and convenient form, what could only be found through much laborious research in the larger works of reference,—the basis of the manual consisting of notes taken from lectures in the Army Veterinary School, Aldershot, supplemented by extracts from Fitzwygram's "Horses and Stables," and Prof. Williams' "Veterinary Medicine" and "Veterinary Surgery."

It is to be noted that the text of the work is so exceedingly concise and devoid of details, as to be of little use to the average beginner, unless he has already gained a more exhaustive knowledge of diseases and injuries, from lectures or from the larger works.

The true function of such a manual would therefore seem to be to act as a refresher of the memory of officers who have already had a more extensive theoretical course, supplemented with as much practical instruction as possible; and this, as the title implies, was evidently the intention of the author. While Fitzwygram's "Horses and Stables" is probably the most complete reference work of its kind in the English language, it is most difficult to make recitations upon its text. U. S. Cavalry officers, contemplating examination for promotion, hailed with much pleasure the publication of that excellent book of Captain Carter's, "Horses, Saddles, and Bridles," and it is believed that the publication of Captain Seton's little manual will likewise meet a popular demand for a book of this kind.

The chapter on medicines opens up the question of just how far cavalry officers can safely act in the prescribing and administering of drugs. To show the possibilities of the future in our own service, it may be stated that during the present session of Congress, a member of the Military Committee (apropos of the bill to increase the pay of veterinary surgeons) stated that he believed in abolishing our present system of regimental veterinary surgeons, and having instead, all treatment rendered by the cavalry officers themselves. It is to be hoped that such a step will never be taken.

On the other hand, such a feature as a chapter on medicines, giving prescriptions for various ailments, has been criticised by one, at least, of our veterinary surgeons, as likely to lead to dangerous results in encouraging officers in the use of drugs, when they had only a superficial knowledge of the same.

It would seem, however, that in our service, with such a small and poorly paid veterinary corps, some knowledge of medicines by cavalry officers should be especially necessary. Time should not be wasted in endeavoring to memorize complicated formulas, but the use of such simples as could be used in emergencies or in "first aid," especially such as could be improvised from materials at hand, should be understood. Isolated scouts by small detachments of our cavalry are of such common occurrence, that the youngest officers are quite frequently called upon to act the part of veterinarians, when the loss of horses might seriously impair the efficiency of the command. Such cases as these would thoroughly test the need of such a work as Captain Seton's "Veterinary Manual," and it is believed that it would prove exceedingly valuable.

CHARLES D. RHODES,
2d Lieut., 6th Cavalry.

* *An Elementary Veterinary Manual*, for the Use of Officers Attending Veterinary Classes. By Bruce Seton, Surgeon-Captain, Indian Medical Service. London: Gale and Polden, Ltd.

Report of the Cavalry and Light Artillery School, 1895.

The earnest and progressive work begun some years ago at the Fort Riley Cavalry and Light Artillery School is still in evidence in the last annual report of its commandant, Colonel A. K. Arnold, 1st U. S. Cavalry. The eminent and attractive feature of this service school is the practical work, both in the preliminary instruction and in the finished product—the combined field exercises. The theoretical course seems to be reduced to actual needs, and one notes with satisfaction the absence of that hyphenated abomination, so revered elsewhere—"student-officers." It has been urged, and Colonel Arnold iterates, that the training at this school receive the recognition of law and be a certificate of proficiency in the branches taught, in examinations for promotion. The War Department, no doubt, has seen the propriety of this, and its wholesome interest in the school thus far is shown by the adoption of former important recommendations of its commandants; as for example, the increase of the number of men in each organization.

Colonel Arnold's report gives in detail the scheme of instruction for the cavalry and light artillery; rules governing the field manœuvres; orders for twelve combined exercises and comments thereon; the same for thirteen cavalry exercises; method of study and drill of the Company of Instruction of the Hospital Corps; the system of instruction in the Recruit School; and the report of the Light Artillery Sub-School, tucked away at the end and occupying about three pages. The school year begins January 10, and from that date to the end of September a carefully subdivided and progressive schedule of instruction is carried out, including the school for recruits. In October, the cavalry field exercises are held and artillery target practice takes place. November and December closes the school year naturally with combined manœuvres. The recruit school is a departure which strongly appeals to the reader of this report. By this system the recruits are placed under the charge of a selected officer and especially qualified non-commissioned officers as assistants and are introduced to the business of soldiering through a carefully devised scheme of progressive training which not only instructs but is elastic enough to adjust itself to the well known variety of material with which our enlisting officers supply us. What a solemn contrast to the shiftless manner of hustling our recruits into ranks seen at most garrisons. After a couple of weeks of half hearted drilling by corporals ashamed of their jobs, the recruit finds himself elbowed into the rear rank, where he is thankful to be lost in the shuffle; or cruelly detailed for guard, where after a hazy experience at guard-mounting, he awakes as a sentinel, bowed by blind responsibility and helplessly despairing of ever getting his general orders untangled. This bad training and premature developmnnt are corrected by the recruit school, the principal of which should be sanctioned by the regulations for all posts of four companies or more.

The commandant recommends that a topographical survey of the reservation be ordered and a contour map constructed. Would it not be possible to turn the practical course in military topography to the very natural good use of having such map constructed by the officers of the school? This could not be done, of course, with the recklessness of hasty field sketching; and even if the work in topography be not so serious, a special effort would be commendable considering the object in view.

There seems to be a difference of opinion at Fort Riley as to the usefulness and necessity for range-finders for the light artillery. Undoubtedly they are of far greater value in peace manœuvres than in war, for the evident reason that in the latter case the percussion shell serves such purpose with quickness and precision. This shell is of especial value in our case as the Ordnance Department has kindly furnished us with a range scale and an elevation scale for different powder velocities, but on the same sight. In the field manœuvres the need for these instruments makes their absence rather surprising. Certainly nothing is lost by their presence.

During the nine months of that careful and detailed instruction of the cavalry as shown by the report, the light artillery appears to have been conforming to the Army Regulations in matters of drill; attending lyceum lectures; going through the light artillery drill regulations; and making road marches when battery drills could not be had. The description of the target practice shows that it was conducted with care and originality, but the seeker after new things is disappointed by the absence of results. A time limit of five minutes seems extraordinarily long for firing ten shrapnel from four guns at 2500 yards at infantry "*rushing* to cover." Major Randolph recommends that "The target practice, instead of being confined to one period of the year, should take place quarterly or semi-annually," and also that "The allowance of ammunition for annual instruction should be at least doubled." Such longing is but the echo of the long deferred hope of the sea-coast artillery. Perhaps success might follow the attempt to reach out for the unexpended allowances of our "city" batteries.

There is a matter, delicate, perhaps, on which we are tempted to comment. It is noticed that in none of the twelve combined manœuvres was a command on either of the contesting sides given to an artillery officer. Past experience and probable future policy should make the natural aim of our military training a broad knowledge of the fighting arms and having sufficient accuracy to be workable with volunteers. Here is a field where officers might study and practice the special methods of two fighting arms and thus prepare them to handle mixed commands. Command comes to us by reason of our rank, not our arm; and one does not need to go back to Sherman, Thomas and Gibbon to recall occasions when the responsibility for composite forces fell to artillery officers. By opportunity to command is not meant that an officer should attempt to direct the details of management and the intricacies of drill of any other arm than his own, but that he should be permitted, through the responsibilities of command, to acquaint himself thoroughly with the capabilities for fighting and manœuvring of all the arms, whatever be his own; and thus enable him to control the weapons in his hand and not compel him to depend solely on the judgment of subordinates.

H. L. HAWTHORNE,
1st Lieut., 1st Artillery.

Napoleon Bonaparte's First Campaign.*

To the mind which appreciates the real criteria of military genius, Napoleon's first campaign in Italy is the most engrossing and instructive study that is offered by the whole of his brilliant career, and for this reason the volume now before us will be warmly welcomed by the more studious class of readers, although it may perhaps not receive the careful attention which it undoubtedly deserves from that large section of the public which has become surfeited with the too generous output of Napoleonic literature. There can be no greater test of the highest order of military capacity than Napoleon was subjected to in his first campaign, and the manner in which he emerged from it placed him, at the age of twenty-six, in the very front rank of generals by a title which was superior to any that he subsequently established, in that the resources at his command were never again so attenuated. What Napoleon had to do in Italy was to achieve results with wholly inadequate means, under a variety of conditions adverse to all hopes of realizing them. These are the circumstances which require genius or the highest order of talent to dominate them. How he succeeded, and why he succeeded, it is the object of this book to tell. He was young, practically unknown, the men under his command were half-starved, ill-clad, irregularly paid, and confronted in a vastly superior position at the outset by an allied force well-

* *Napoleon Bonaparte's First Campaign.* With comments by Herbert H. Sargent, First Lieutenant, Second Cavalry, United States Army. London: Kegan Paul, Trench, Tübner & Co.

formed, numerically greater, manœuvring in a rich country within easy reach of their own base, and led by commanders who were probably as good as any at that particular epoch save the unrevealed Corsican whom it was their ill fate to meet. Nor can we estimate how far Napoleon's youthful genius redressed the balance without taking into account the unpatriotic jealousy of the Directory in Paris which withheld from him the modest reinforcements for which he clamored, and thereby unconsciously contributed to aggrandize his fame and his subsequent power. Neither French nor English writers can ever attain to a severely impartial and judicial spirit in their dissertations upon a man who had so dire an influence in embittering the relations between the two peoples. American critics however are far more successful in passing a fair and candid judgment, because they are on this subject better able to write without prepossession or prejudice; and Lieutenant Sargent has, in our opinion, furnished an exceedingly admirable little history, distinguished alike for the clear arrangements of its facts, and the judiciousness of its comments. Whether Napoleon invented the root principle of his strategy of operating upon interior lines, dividing the forces of his enemy and massing a superior force upon the point of attack, as subsequent students in his school believed, and the generals of his day undoubtedly thought when they denounced his methods; or whether he was merely, as Lieutenant Sargent holds, the first of modern commanders to apply hoary and immutable principles of strategy, is immaterial. The principle is permanently associated with his name, and the dazzling successes of his first campaign, which opened with the sea at his back and a chain of mountains between him and his allied foes, and ended at Leoben after the destruction of six Austrian armies and 120,000 men illustrates more completely than any of Napoleon's subsequent wars the effects of his strategy. Lieutenant Sargent in his interesting comments upon the campaign sums up its striking results thus: "Throughout the campaign the average strength of the French forces was 46,000, and that of the opposing forces 61,000—a ratio of about three to four. With these numbers Bonaparte defeated one Sardinian army and six Austrian armies, and killed, wounded, or captured 120,000 men. During the entire struggle each French soldier put *hors de combat*, on an average, two and a half Austrians, and 46,000 Frenchmen were more than a match for 61,000 Austrians." The Austrians fought bravely throughout; but even when, as at Arcola and Rivoli, Bonaparte was unable to outnumber the enemy at any point of the battle-field he achieved the victory by skill in tactics, and defeated 70,000 Austrians with 40,000 men. The author has a ready knack of enshrining the lessons to be deduced from this campaign in very clear language, and the criticisms which follow upon the description of each battle are models of perspicuity. The decline of Napoleon's energy towards the close of his career has often been dwelt upon, but the activity of his youthful days was preternatural, and at no period of the Italian campaign was it more strikingly manifested than at Rivoli. How he infused his own energy into his men we can judge from the account of Masséna's Division which, after marching and fighting continuously for twenty-four hours marched the whole night, all the next day, and after a short rest was ready for battle in front of Mantua. Special interest, we would observe in conclusion, attaches to the struggle on the Tagliamento, where Bonaparte first encountered the Archduke Charles, who had, on that occasion, but restricted opportunities of displaying the high military talents he possessed. A succession of useful little maps dispersed through the book serve to illustrate the comments in the text.—*The Broad Arrow.*

Publisher's Department.

THE **cocoa and chocolate manufacturing establishment of Walter Baker & Company, Limited, Dorchester, Mass.,** is not only the oldest but the largest of its kind on this continent. The mills belonging to this house are situated on the Neponset River, partly in the Dorchester District of Boston, and partly in the town of Milton. The plant comprises five large mills (having a floor space of about 315,000 square feet, over seven acres), equipped with all the latest and most improved machinery. The full strength and the exquisite natural flavor of the raw material are preserved unimpaired in all of Walter Baker & Company's preparations; so that their products may truly be said to form the standard for purity and excellence.

Since the establishment of the firm in 1780, its preparations have been in demand everywhere. There is no place on this continent, and beyond it, where they cannot be had; and as the cost is within reach of everybody, and the preparations are absolutely pure and health giving, it is not surprising that the demand is increasing from year to year.

* * *

The Windsor Hotel, on Fifth Avenue, occupying an entire block, between Forty-sixth and Forty-seventh Streets, is so situated that it is a most attractive hostelry in summer. Because of its location it is probably the coolest house in the city. There is an opening from Fifth Avenue to Madison Avenue, which gives it a ventilation possessed by no other hotel. Then, again, there is a particular satisfaction in knowing that your temporary home is fitted up with such special regard to the laws of hygiene as the advancment of sanitary engineering has made possible. The name of Leland is synonymous with good hotel keeping, and when Warren F. Leland, that veteran boniface, took possession of the Windsor on May 1, he determined that this long-famous house, like those previously under his management, should be fully up to date. Recently there has been expended $90,000 in a renovation of the plumbing system. Decorations and a new steam and electric lighting plant will cost $100,000 more. Many other improvements for the comfort of the guests are in progress. Mr. Leland, a member of a famous family of hotel-keepers, is known to the travelling public as a model host. As proprietor of the Delavan House in Albany, the Leland House in Chicago, which he sold to a syndicate just previous to the opening of the World's Fair; the Ocean Hotel in Newport, and the Chicago Beach Hotel, he has gained a wide experience, of which the guests of the Windsor will benefit.

The Windsor is a fine building, with five hundred big, airy well-ventilated rooms. The dining-room is the handsomest, largest and coolest in New York city. All the silver, china and glassware is of a special design. As an innovation Mr. Leland has introduced music during the dinner hour, from 6 to 8 P. M. A superior chef has been installed in charge of the kitchen, which is a model in its perfect appointments, and the table of the Windsor will become a feature of the hotel under the new management.

The Windsor will be conducted on both the European and American plans. The rates will be $4 per day and upward on the American plan and $1.50 per day and upward

on the European plan, with free 'busses and free transfer of baggage to and from the Grand Central station.

Within easy distance of the great city's attractions—its theatres, art galleries, drives and, not least to the women, its fashionable shopping district, it would be almost impossible to conceive of a better location than that of the Windsor, particularly for the visitor who wants to enjoy the many pleasures of city life. The Windsor is within a block of three great transportation lines, the Sixth Avenue surface and L roads and the Fourth Avenue street-car line. It is but a few blocks from the Grand Central station and almost in sight of Central Park, and the Fifth Avenue stage will carry one there in about seven minutes.

* * *

Yeast Nuclein in the Treatment of Hip-Joint Disease.—In the *American Lancet* for January, 1895, Dr. Charles W. Hitchcock, of Detroit, remarks that not all cases of hip disease are, with any fair promise of success, amenable to conservative treatment. Cases long neglected, in which erosion of the joint structures has already occurred, together with suppuration and resulting fistulæ, are not encouraging instances for non-operative measures. An early diagnosis is of the utmost importance, that the case may be taken in hand before gross and irreparable damage has placed it beyond the reach of any save the most heroic treatment.

The nucleins, says Dr. Hitchcock, are among the newer remedies that may do much as an aid to tissue-building, more especially as they are said to influence cell metabolism so as to bring about a healthy resistance to disease processes.

The germicidal properties of nuclein, he continues, have been demonstrated, and Vaughan and McClintock have shown that the germicidal constituent of blood-serum is a nuclein. Parke, Davis & Co., he says, have rendered yeast nuclein accessible to the profession. They make it for Dr. Vaughan and according to his formula; the solution which they supply is about a one per cent. solution. Of this solution of yeast nuclein, from five to sixty minims may be administered at a time. The dose may be increased gradually and cautiously from the initial dose (which may appropriately be about ten minims), regard being had to the febrile reactions, which may be decidedly marked and are to be looked out for.

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Prize Essay—1896.

I.—The following Resolution of Council is published for the information of all concerned:

Resolved, That a Prize of a Gold Medal, together with $100 and a Certificate of Life Membership, be offered annually by THE MILITARY SERVICE INSTITUTION OF THE UNITED STATES for the best essay on a military topic of current interest; the subject to be selected by the Executive Council and the Prize awarded under the following conditions:

1. Competition to be open to all persons eligible to membership.

2. Each competitor shall send three copies of his Essay in a sealed envelope to the Secretary *on or before September* 1, 1896. The Essay must be strictly anonymous, but the author shall adopt some *nom de plume* and sign the same to the Essay, followed by a figure corresponding with the number of pages of MS.; a sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, should accompany the Essay. This envelope to be opened in the presence of the Council after the decision of the Board of Award has been received.

3. The prize shall be awarded upon the recommendation of a Board consisting of three suitable persons chosen by the Executive Council, who will be requested to designate *the Essay deemed worthy of the prize;* and also in their order of merit those deserving of honorable mention.

In determining the essay worthy of the prize, the Board will be requested to consider its professional excellence, usefulness and valuable originality, as of the first importance, and its literary merit as of the second importance. Should members of the Board determine that no essay is worthy of the prize, they may designate one or more essays simply as of honorable mention; in either case, they will be requested to designate one essay as first honorable mention. Should the Board deem proper, it may recommend neither prize nor honorable mention. Should it be so desired, the recommendation of individual members will be considered as confidential by the Council.

4. The successful Essay shall be published in the Journal of the Institution, and the Essays deemed worthy of honorable mention shall be read before the Institution, or published, at the discretion of the Council.

5. Essays must not exceed twenty thousand words, or fifty pages of the size and style of the JOURNAL (exclusive of tables).

II.—The Subject selected by the Council at a meeting held Sept. 13, 1895, for the Prize Essay of 1896, is

"*THE PROPER MILITARY INSTRUCTION FOR OUR OFFICERS; THE METHOD TO BE EMPLOYED, ITS SCOPE AND FULL DEVELOPMENT.*"

III.—The gentlemen chosen by the Council to constitute the Board of Awards for the year 1896 are:

GENERAL E. S. OTIS, U. S. A.
GENERAL FRANCIS A. WALKER, U. S. Vols.
COL. L. H. CARPENTER, U. S. A.

JAMES FORNANCE,
Secretary.

GOVERNOR'S ISLAND,
Nov. 1, 1895.